MARCH 5, 1938

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. X., OF VOL. I., 1938. LONDON, SATURDAY, MARCH 5, 1938. Pp. 136—Price 1s.
No. 5975. VOL. CCXXXIV Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

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No. 5975 LONDON: SATURDAY, MARCH 5, 1938 CCXXXIV

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ADDRESSES AND ORIGINAL ARTICLES

THE TREATMENT OF RETENTION OF THE TESTIS *

BY T. W. MIMPRISS, M.S. Lond., F.R.C.S. Eng.
CHIEF ASSISTANT, SURGICAL UNIT, ST. THOMAS'S HOSPITAL, LONDON

ALTHOUGH A. D. Bevan was by no means the first to operate on children suffering from retention of the testis, the views expressed in his paper in 1899 represented a great advance, and he laid the foundation for the surgical treatment which has now been employed for many years. Treatment underwent no further radical change until the introduction by Schapiro (1930) of hormone therapy, and enough time has now elapsed for some conclusions to be drawn as to the place of surgery and hormone therapy in this condition.

The term retention is here used to include all cases in which the testis is absent from the scrotum at birth : cases in which the testis is occasionally absent from the scrotum are referred to as instances of retraction.

This paper is based on a study of the treatment adopted at St. Thomas's Hospital over a period of 11 years (1927 to 1937).

SURGICAL TREATMENT

A follow-up of the patients admitted in the eight-year period, 1927–34, shows the results of surgery (Table I).

TABLE I—SURGICAL TREATMENT AT ST. THOMAS'S HOSPITAL (1927–34)

Patients admitted	172	
Condition		
Retention of right testis	75	patients.
" left testis	53	"
" both testes	44	"
Number of retained testes	216	
Treatment		
Orchidopexy	138	
Abdominal reposition	7	
Orchidectomy	36	
No treatment	35	

Coexistent hernial sacs were noted in 85 per cent. of these operations.

TABLE II—RESULTS OF THREE TYPES OF OPERATION

A.—70 *operations*		
Testis well down in scrotum and of good size	28	
High scrotal—small size	29	
Pubic or inguinal position—small	13	
Proportion of satisfactory results ..	40	per cent.
B.—9 *operations*		
Good position and size	4	
High scrotal position and small	3	
Inguinal position—small	2	
Proportion of satisfactory results ..	44	per cent.
C.—13 *operations*		
Good position and development	11	
Good position—small size	1	
High scrotal—small size	1	
Proportion of satisfactory results ..	85	per cent.

Patients on whom an orchidopexy had been performed were asked to report and 80 patients representing 92 orchidopexies attended. In this group three types of operations had been performed.

(*a*) Modification of the operation described by Bevan. The testis is freed and the cord elongated by excision of the processus vaginalis and fibrous and connective tissue components of the cord. The testis is then held down in the scrotum for ten days by the traction of a stitch passed through the scrotum and fastened to the thigh—a procedure of which Bevan expressly disapproved.

(*b*) A similar operation in which no traction stitch was employed.

(*c*) The operation of septal transposition described by Turner.

The *results* of these operations have been judged by the position and size of the testis, and are set out in Table II.

The similarity in the results of Types A and B suggests that the tension suture does not act for a sufficient period to have a lasting effect.

Age.—In this series factors such as (1) ectopia, as opposed to imperfect descent; (2) bilateral, as opposed to unilateral retention; (3) the position of the testis before operation; and (4) the age of the patient at operation did not seriously affect the outcome of one type of operation as opposed to another. Age is the only factor which favoured the septal transposition group, but it does not account for the great disparity (see Table III).

TABLE III—EFFECT OF AGE AT OPERATION ON RESULT

Age.	Number of operations.	Number of good results.	Per cent. satisfactory.
Whole Series			
Under 10 ..	29	10	34
10–14	45	27	60
Over 14 ..	18	6	33
All ages ..	92	43	46·7
Bevan Operations			
Under 10 ..	28	9	32
10–14	37	19	51
Over 14 ..	14	4	29
All ages ..	79	32	41·1
Turner Operations			
Under 10 ..	1	1	100
10–14	8	8	100
Over 14 ..	4	2	50
All ages ..	13	11	85

Table III shows that in the whole series the best results were obtained at the 10–14 age-period; and that in the Bevan cases the results were least unsatisfactory at this period. This is the time at which puberty changes occur, including growth of the testis, elongation of the cord, and development of the scrotum—all mechanical factors which assist in the satisfactory outcome of any orchidopexy.

Spontaneous descent.—There is one other point in this follow-up which is important. In three boys, who were classified as cases of bilateral retention and on whom a unilateral orchidopexy was performed, spontaneous descent of the other testis had occurred by the time I saw them. In each case the operation had been performed in the early age-period and in each case the operative result was a failure. Having noted this undoubted incidence of spontaneous descent, I requested the small group of children

* A Hunterian lecture delivered before the Royal College of Surgeons of England on Jan. 31st.

discharged without treatment to attend. Twelve responded (8 bilateral and 4 unilateral cases). The position of the bilateral cases is now as follows:—

Spontaneous descent on both sides has occurred in	2	children.
" " one side " "	2	"
Testes still retained in	4	"

Of the unilateral cases spontaneous descent occurred in 1 child.

Three conclusions can justifiably be drawn from this section of the paper: (1) The anatomical results of orchidopexy are better if operation is deferred until the 10–14 age-period—i.e., the period of puberty. (2) An orchidopexy of the Bevan type is unsatisfactory as a routine procedure. (3) Spontaneous descent of the retained testis can occur in older children.

HISTOLOGY OF RETAINED TESTES

Before accepting 10–14 as the correct period for orchidopexy, it is necessary to consider the histology of the retained testis.

It is well known that retained testes examined after puberty have undergone some degree of degeneration, characterised by intertubular fibrosis, thickening of the basement membrane, decrease in the number of tubules, absence of spermatogenesis, and replacement of the tubular cells by cells of Sertoli. The histology of the retained testis in younger children is on a less sure footing; Wangensteen (1927) wrote: "Numerous authors state that the anatomy of the imperfectly descended testis is normal up to puberty, but unfortunately very few are available for microscopy." He agreed however that the undescended pre-puberty testis is histologically similar to the scrotal testis of the same age.

Cooper (1929) found that the pre-adolescent undescended testis is healthy but undeveloped, and pointed out also that even some scrotal testes in the early years showed arrest of development. This is characterised by the isolation of the tubules, the increase of interstitial tissue which appears in the form of a nucleated embryonic stroma, and a diminution in size of the tubules.

The evidence is then that the infantile retained testis has a relatively normal histological appearance but that with adolescence degenerative changes appear. There is certainly no reason to doubt that a retained testis which is showing only the signs of delayed development can develop normally if placed in the scrotum.

Apparently degenerative changes do not necessarily indicate inability to develop. The experimental work of Wangensteen suggests that a retained testis whose tubules still contain spermatogonia is capable of development and activity if placed under suitable conditions in the scrotum. Obviously it is better to transplant the testis before degenerative signs have supervened on those of retarded development; but in the opinion of authorities such as Cabot (1935) orchidopexy should be considered for many adults suffering from this condition.

I have examined sections of twenty specimens of retained testes obtained by orchidectomy in this series to ascertain (1) if degenerative changes were present at the 10–14 age-period, (2) if testes retained after this age were still capable of development.

In the *first group* there are six specimens removed at the ages of 10, 10, 11, 13, 13, 14. The sections of all these testes show small tubules isolated by a nucleated embryonic stroma; the tubular cells consist chiefly of spermatogonia and undifferentiated cells. One can say therefore that these all represent the picture of delayed development and have undergone no degenerative change as a result of their failure to reach the scrotum before this 10–14 age-period. Arrest of development is a conspicuous feature of these testes; but the records show that at operation they were found to be small and retained high up on the line of descent. Hence it is fair to assume that these sections present as unfavourable a histological picture as any retained testis at that age is likely to show.

In the *second group* there are fourteen specimens removed at the following ages: 16, 17, 17, 21, 21, 22, 24, 26, 27, 28, 33, 35, 47, 48. These all show degenerative changes in varying degrees. Only five show spermatogonia in the tubules. They were excised at the ages of 16, 17, 17, 21, 48. Actually the atrophic changes in the two last are so marked that one cannot take an optimistic view of their potential activity; but the three younger ones appear to be capable of development.

Wangensteen (1927) examined 17 adult retained testes and found spermatogonia present in the tubules of 2, while Pace and Cabot (1936), on the same principle, considered 13 out of 24 which they examined might have developed if a satisfactory orchidopexy had been accomplished.

Here again it is likely that these testes excised at operation represent the smaller and more atrophic specimens of retained testes at this age-period, and it is probably justifiable to perform an orchidopexy on a man below 30, provided that the operation is not unduly difficult from a mechanical aspect.

This histological portion of this follow-up therefore shows that delayed development is still the characteristic of the retained testis at the 10–14 age-period and that orchidopexy can safely be deferred until this age. After the age of 16 degenerative changes are constant, and though orchidopexy is justifiable in young adults the chance of obtaining an active testis after the age of 20 is probably small.

HORMONE THERAPY

The next investigation into this subject took the form of a trial of gonadotropic hormone therapy on a series of fourteen new patients who were unselected except for the fact that they were between the ages of 5 and 15 and included no cases of obvious ectopic descent or of retraction of the testis.

The preparation used was Pregnyl (Organon Laboratories). This was administered intramuscularly in doses of 500 rat units, either once or twice a week. The number of injections varied between 8 and 40. The effect on all patients was to stimulate the growth of the external genitalia—i.e., the penis, scrotum, and testes. Descent of the testis was obtained in four children, and seemed to be entirely dependent on this increase of development of the genitalia. As development increased so did the testis descend further and further along the natural line of descent. The common characteristic of these successful cases, prior to treatment, was that their genital development was small and showed no evidence of a puberty change, and further, that the testes were mobile and could be pushed down in the direction of the scrotum. The remaining ten children failed to obtain descent; but their response to the treatment is interesting.

One boy of the Fröhlich type, who presented gross hypogenitalism, showed little developmental change, and neither testis could be palpated at the end of treatment.

The other nine children, only one of whom showed subnormal genital development, all reacted to treatment in that development of the external genitalia was stimulated, but in contrast to the four successful cases this increase in development was not accompanied by a gradual descent of the testis. An orchidopexy was subsequently performed in each case and at operation the testis was found to be mechanically retained.

Mechanical retention is a term used to imply the presence of an anatomical factor other than shortness of the cord which prevents a testis from reaching the scrotum. It includes cases in which the testis is retained above a ring; is adherent to some other structure; is ectopic; or is prevented from reaching the scrotum by the absence of a path into the scrotum.

The results in these fourteen children suggested strongly that development of the genitalia had a very important bearing on retention of the testis.

Continued retention in the presence of increasing development of the reproductive system seemed to denote a mechanical cause of retention which could only be overcome by operation. On the other hand some testes which were associated with small development appeared to descend as development of the reproductive system ensued.

It therefore seemed that hormone therapy could be usefully employed only in those children in whom retention was associated with small genital development.

SPONTANEOUS DESCENT

Further experience of children suffering from this condition led me to wonder whether my four successful patients would not have achieved descent unaided as their reproductive systems developed. There was no reason to suppose that natural development had reached its limit by the time therapy was started, so it seemed likely that the testis might have descended spontaneously—a possibility not universally accepted.

Several instances of spontaneous descent in older children were noted during my follow-up of the 1927–34 period. So it seemed reasonable to ascertain if descent could be achieved by allowing development to proceed naturally instead of by hormonic stimulation.

A comparable group of patients (thirty-one in number) were therefore treated on different lines. No treatment was considered until they had reached puberty, between the ages of 10 to 16, but they were kept under observation.

Where increased development was associated with a retained testis which could not be manipulated into the top of the scrotum, orchidopexy was performed, and in the nine boys so treated mechanical retention was found in each case.

No less than nine patients obtained spontaneous descent during this period of observation at the ages of 3, 5, 8, 9, 10, 11, 12, 13, 16. These children were similar to those in whom success was obtained by the use of hormone therapy—that is to say, they were suffering from no gross endocrine disturbance, but their retention was associated with subnormal development of the genitalia. When first seen the penis and scrotum were small and the testes were small and could be manipulated down along the normal line of descent.

Descent has kept pace with the gradual onset of growth of the whole reproductive system. The age at which it has been complete has depended upon the degree of development of the reproductive system, which even in normal children is not constant.

I want now to compare the results of this period of observation with my previous results from hormone therapy.

In the hormone series fourteen new cases were submitted to treatment; four successes were obtained. A rather rapid genital development was produced and descent occurred in a period of a few months. In the period of observation (2½ years) thirty-one new cases were followed; descent has occurred in nine and there are probably more potential successes.

The type of case which reacted favourably to pregnyl is the type in which spontaneous descent has occurred.

Development of the reproductive system occurred in both groups, although at rather different rates. With that development the testis either descended or, if it failed to do so, an operation was necessary to deal with the underlying mechanical factor.

ACTION OF HORMONES

Before proceeding with the routine use of hormone therapy, it seemed necessary to consider its action and effect more carefully.

Experimental results are variable, but the evidence is that while gonadotropic hormones have little effect on the mature male they greatly increase the growth of the reproductive system of the immature male.

Experimentally hormones can produce a precocious puberty in animals, and there are many clinical reports suggesting that they will produce a precocious puberty development of the reproductive system if given in sufficient doses.

Dorff (1935) quotes the following effects in hypogenitalism: hypoplastic testes increase in size; the scrotum fills out and progresses towards normal development; the penis enlarges in size and thickness and pubic hair develops; the epididymis and prostate are stimulated and the general mental aspect of the patient changes. In some cases he noted congestion of the external genitalia and frequent erections.

On this basis the mechanism of a hormone success is apparent. Any undescended testis that would descend as development increases can be brought down by hormone therapy if the dosage is adequate to stimulate sufficient growth of the reproductive system. My experience of treating one series by hormones and another by observation bears evidence to the fact that the testis which is not mechanically retained is only awaiting an adequate degree of development before the scrotal position is gained.

INDICATIONS FOR HORMONE THERAPY

In spite of the successes reported by other workers, sometimes with even one or two injections, the evidence is that hormone therapy can only induce descent of a retained testis by means of its stimulating effect on the development of the reproductive system; and further that development will often take place naturally if the opportunity is given. On this basis one can discuss the question of administering hormone therapy in all cases or of reserving its use for cases in which natural development seems unlikely—an event which certainly cannot be excluded until the age of 12.

There are two possible objections to the routine use of hormone therapy. Stimulation of the reproductive system may be (1) undesirable, (2) harmful. Precocious sexual maturity has been recorded on many occasions and has led clinicians to withhold hormone therapy in young children. Prostatic enlargement has been recorded by Dorff (1935), Sexton (1934), and Aberle and Jenkins (1934). I have noted this in one child and although it produced no symptoms it is, I think, undesirable.

The question of late damage to the testis has been raised by Cabot (1936) and is not yet settled. Experimental evidence obtained from the immature animal is inconclusive, although Cole (1936) has noted signs of damage in the tubules of rats treated with heavy dosage. Clinical evidence of damage is not forthcoming, for these preparations have only been used for a few years; but a retained testis in one of my patients which enlarged considerably during treatment had retrogressed in size and was found to be

small at operation some months later. It is reasonable to suppose that a retained testis which receives an artificial puberty stimulus, but fails to descend, should undergo those degenerative changes which are well known to ensue in untreated cases which fail to descend after puberty.

EFFECTS IN RATS

If hormone therapy can damage the testis, it is the undescended organ which will suffer most. In support of this statement I have tried the effect of hormones on both the descended and the retained testes of rats.

(I) *Effect on the reproductive system of the immature rat.*—Young rats received four doses of 50 rat units of pregnyl at 3-day intervals, starting at the 17th day. They and a litter control were killed at weekly intervals starting at the 27th day, so that the immediate and late effects of this treatment could be ascertained on (*a*) the growth of the reproductive system, and (*b*) the histology of the testis. Table IV shows the

TABLE IV—EFFECT OF GONADOTROPIC HORMONE ON DEVELOPMENT IN RATS

Age in days.	Weight of testes in grammes.		Weight of prostate and vesicles in grammes.	
	Control.	Injected.	Control.	Injected.
27	0·30	0·40	0·04	0·13
34	0·70	0·58	0·11	0·34
41	1·12	0·94	0·14	0·43
48	1·52	1·17	0·20	0·66
55	1·82	1·40	0·23	0·64
62	2·21	1·88	0·35	0·89

remarkable stimulus to growth in the early stages, as recorded by many observers. In the later weeks on the other hand the testes in each case weighed less than the controls, although the prostate and vesicles maintained their lead.

The histology of these testes is more difficult. In the early sections there is a hyperæmia and œdema of the testis and an albuminous secretion in the tubules which probably accounts for an increase in weight at this stage. There is no evidence of the hyperplasia of the interstitial cells which is recorded by others, the majority of whom have used smaller and more frequent doses of hormone. In the later stages when the injected testis weighed less than the control there is little apparent histological difference except in the two last, where there is the appearance of tubular damage, in that the tubular cells are less active and less numerous.

In the immature rat, then, four large doses of pregnyl produced gross hypertrophy of the accessory organs of reproduction, with hypertrophy of the testis in the early stages, followed by a relative loss of weight later, this loss of weight being suggestive of damage to the testis.

(II) *Effect on the reproductive system of the immature male rat, in which artificial retention of the testes has been produced.*—These experiments were on exactly similar lines to the previous ones; except that both the injected rat and its control were operated on to produce bilateral retention of the testis at the 14th day. Four doses of 50 rat units of pregnyl were given at 3-day intervals, starting at the 17th day.

In the control rats the weight of the testis and accessory organs was almost constant (Table V). In the injected rats the accessory organs showed a relative increase, while the testes showed a relative decrease in weight.

In these experiments the histological changes are definite. The testes of the control rats showed changes which progressed gradually according to age. The tubules enlarge, but the tubular cells fail to proliferate to a corresponding degree so that the lumen of the tubules appears wide. This appearance is most marked in the testes of the rat killed at

TABLE V—EFFECT OF PREGNYL IN RATS WITH ARTIFICIAL RETENTION OF TESTES

Age in days.	Weight of testes in grammes.		Weight of prostate and vesicles in grammes.	
	Control.	Injected.	Control.	Injected.
32	0·53	0·46	0·11	0·16
39	0·52	0·41	0·10	0·17
46	0·45	0·32	0·09	0·19
53	0·50	0·32	0·09	0·26

the 53rd day; but even here the tubules are still closely packed together and there is no evidence of a gross degenerative process.

The testes of the injected rats show that the enlargement of the tubules and the associated failure of proliferation of the tubular cells occurred at an earlier age. The testes of rats killed at the 46th and 53rd day both showed well-marked degenerative changes which are not seen in the controlled testes—i.e., the tubules are relatively few in number, the tubular cells are very scanty, and there is evidence of early intertubular fibrosis. If the weight of the testis and the histological findings are taken into account, it is apparent that the effect of hormone injections has been to stimulate the onset both of development and of subsequent degeneration in these mechanically retained testes.

These experiments suggest that there are definite risks in stimulating the development of a child's testis which cannot descend into the scrotum, as the onset of degenerative changes may be hastened.

The following conclusions can be drawn from this section dealing with hormone therapy and spontaneous descent.

1. Spontaneous descent of the retained testis does occur between birth and puberty and is dependent on the increased development of the reproductive system.

2. Persistent retention in the presence of increasing development signifies that the testis is retained through a mechanical abnormality which can only be overcome by operation.

3. Hormone therapy aims at stimulating the development of the reproductive system and therefore hastens descent. Its routine use is unnecessary as natural development will usually occur and is undesirable as it (1) produces precocious puberty, and (2) may cause atrophy of testes that are mechanically retained. It should be withheld until the age of twelve and used then for children in whom natural development is not taking place.

MANAGEMENT OF RETENTION

There are two principal theories as to the cause of retention. One was expressed by John Hunter in 1786: "It is not easy to ascertain the cause of the failure in the descent of the testis; but I am inclined to suspect that the fault originates in the testicles themselves." The other was summed up by Wangensteen (1927): "The undescended testicle owes its imperfection to its position."

The first theory implies that the development of the testis and of the whole reproductive system is at fault; that if the developmental factor were rectified the testis would descend. The second implies that the testis develops normally, as far as it

may in its abnormal position, but is prevented from coming down by a mechanical factor which may be bands; adhesions; an ectopic position; or the absence of a path into the scrotum. I have recorded sufficient instances of spontaneous descent, hormone successes, and operations for the relief of mechanical retention to show that there is truth in each.

Management therefore aims at correcting a developmental fault or a mechanical fault or a combination of the two. If both faults are present development must if possible be rectified first, as an undeveloped testis with a short cord cannot satisfactorily be transplanted into a rudimentary scrotum. Retarded development may be corrected by natural growth or by hormonic stimulation. Mechanical retention can only be overcome by operation.

Treatment incorrectly applied can be both unnecessary and harmful. Operations where development is at fault and hormone therapy where there is a purely mechanical obstruction are examples of this. For this reason it is essential to assess the factors responsible for retention before commencing active treatment.

At birth I believe it is impossible to say why a testis is not in the scrotum; or whether the fault is developmental or mechanical or a combination of the two; further, whether a developmental failure will be rectified naturally. This does not matter since in the absence of complications the cause of retention is immaterial until the period of puberty is reached. Until this time the testis does not suffer by remaining in its undescended position and the optimum age for treatment has not been reached.

I believe, moreover, that development should not be stimulated by hormones until the age that puberty changes should occur; and that operation also should not be employed until this period, so that in the absence of complications, the problem of the retained testis does not arise until the age of 10.

Between birth and the age of 10 many children whose testes were retained owing to developmental retardation will have obtained development sufficient for spontaneous descent to occur. At or after the age of 10 the factors responsible for continued retention can be assessed and treatment administered where necessary. Treatment is still unnecessary if spontaneous descent is likely. Treatment is necessary

TABLE VI—CLASSIFICATION AND TREATMENT

A. *Mechanical Retention* (Bilateral/Unilateral)

Type: Normal child.
Normal genital development.
Testis in an ectopic position or incapable of manipulation towards the top of the scrotum.
Treatment: Orchidopexy.

B. *Retention due to Delayed Development* (Bilateral/Unilateral)

Type: Normal child.
Subnormal genital development.
Testis small and mobile in the direction of the scrotum.
Treatment: Usually unnecessary as spontaneous descent is likely.
If the scrotum is enlarging and the testis can be manipulated to the top of the scrotum, descent is imminent.
Hormone therapy can reasonably be employed after the age of 12.

C. *Retention associated with an Endocrine Disturbance* (Bilateral/Unilateral)

Type: Abnormal child (e.g., Fröhlich's type).
Marked hypogenitalism.
Testis may or may not be be mechanically retained. In the presence of hypogenitalism it is often impossible to state whether a mechanical factor is present.
Treatment: Hormone therapy at or after the age of 12.
Orchidopexy may be necessary later.

by hormone therapy if natural development seems unlikely and by operation if the testis is mechanically retained.

Children can be classified into three main groups at this period by noting (1) the general appearance of the child, (2) the development of the genitalia, and (3) the situation and mobility of the testis (Table VI).

No simple classification can cover every case, and no line of treatment can be universally successful, but management on these lines should allow spontaneous descent to occur where possible; hormone therapy to be used where development is grossly at fault; and operations to be employed on testes whose failure to descend is due to causes other than lack of development.

A classification of the thirty-one children collected since 1935 shows that ten of them (four bilateral and six unilateral) are still below the age of 10. Descent has occurred on one side in two and on both sides in another bilateral case. Of the unilateral cases descent has occurred in one child and one child with mechanical retention developed a hernia at the age of 8 and was submitted to orchidopexy.

TABLE VII

Bilateral Cases

(I) Mechanical—3 boys: orchidopexy has been performed at about the age of 12.

(II) Delayed—6 boys: descent has occurred on both sides in 3 and on one side in 1 boy and is likely to follow in the other 2 in whom development is still small.

(III) Endocrine—1 boy: receiving treatment with pregnyl.

Unilateral Cases

(I) Mechanical—7 boys: in 5 orchidopexy has been performed; in 2 development is still small and it is better to wait longer.

(II) Delayed—3 boys: in 1 descent has now occurred and in the others is likely.

(III) Endocrine—1 boy: will soon receive hormone therapy.

Over the age of 10 there are now ten bilateral and eleven unilateral cases classified under the headings of: (I) mechanical, (II) delayed, and (III) endocrine.

Starting therefore with thirty-one children suffering from retention of the testis at birth this method of management has enabled nine to solve the problem for themselves, and nine to have an orchidopexy on a mechanically retained testis at an age when development was sufficient for a good anatomical result to be obtained.

Thirteen are left. In four there is every reason to expect that descent will occur. In two increase of development suggests more and more definitely that orchidopexy will be necessary to deal with the mechanical cause of retention. Five at present I would hesitate to put into any group; but, as they are young, that is immaterial. Two suffer from an obvious endocrine disturbance; one is having hormone therapy and the other will need it.

Two years ago I should have given this group of thirty-one children a course of pregnyl and should have had nine successes and nine failures; but I can now state that both successes and failures would have been inevitable. Therefore no routine course of therapy will be employed in those boys in whom retention is still present.

There is a place for hormone therapy; but in my opinion not a very large one. As yet it has been used on two children in this group of thirty-one.

One was a boy of 16 with bilateral retention in whom development was very late in appearing, but in whom spontaneous descent had progressed to the stage when both testes would lie in the upper part of the scrotum. As he was entering a Service it seemed reasonable to hasten the process, and this was achieved by hormone therapy. I classify him as an instance of spontaneous descent.

The other is a boy of the Fröhlich's type with bilateral cryptorchidism and gross hypogenitalism. Under prolonged and energetic hormone therapy his penis and scrotum have developed somewhat, but his testes have remained retained and impalpable.

I have only recently realised that these two patients summarise my experiences with this product; that is to say, one can get a good result in the patient in whom descent will occur anyway and a result of doubtful nature in the children who really do present a problem for treatment.

KEETLEY-TOREK TECHNIQUE

Whatever views one has as to the use and misuse of gonadotropic hormone therapy, the fact remains that orchidopexy has to be performed on testes retained by a mechanical cause.

The general consensus of opinion points to the Keetley-Torek technique as the most satisfactory. This method enables the testis to be held in good position indefinitely while the scrotum enlarges. This is one reason why the results are good; another is that the technique can only be employed if the testes will reach well down into the scrotum. The septal transposition operation also has these advantages but fails to produce so good an anatomical result.

The thirty-three orchidopexies by the Keetley-Torek technique performed at St. Thomas's Hospital surgical unit can be divided into the following groups:—

Group 1.—Seven in patients who had had previous unsuccessful Bevan operations, without sustaining damage to the testis.

Group 2.—Twenty-six in new cases in the following age-periods: 7–9 (3 operations); 10–15 (17 operations); 16–30 (6 operations).

The *results* have been judged by the same standards as in the original follow-up of orchidopexies; they are:—

Group 1.—All seven satisfactory.

Group 2.—(*a*) 2 good, 1 unsatisfactory; (*b*) 16 good, 1 unsatisfactory; (*c*) 5 good, 1 unsatisfactory. Total—90 per cent. satisfactory.

The failure in the 7–9 age-period was due to an error of judgment in operating on a boy who had an obvious ectopic testis, but in whom development of the genitalia was not very advanced. A small ectopic testis was freed, but the cord was too short to enable it to reach the scrotum. Had operation been deferred for two or three years, it is unlikely that this difficulty would have been encountered.

The failure in the 10–15 age-period was I think excusable. The boy was aged 12 and had been treated with pregnyl; his development was considerable; but at operation the testis was found in the abdominal cavity and again the cord was short.

I am hopeful that both these failures can be corrected at a second operation, as great care was taken in preserving the blood-supply and the testes were left at the external ring, as suggested by Cabot.

The failure in the adult group was one of technique, in that the anastomosis between the scrotum and the thigh parted at the 10th day.

The results of this small series of orchidopexies compare very favourably with those of the 1927–34 operation period. In part it is certainly due to changing the standard operative procedure from Bevan to Keetley-Torek. The other factor which has been very important in this series is that the necessity of avoiding operation in young, poorly developed children has been recognised.

In the later operations of this series there has been a slight deviation from the Keetley-Torek technique. A much smaller anastomosis is made between the lowest part of the scrotum and the skin well down on the thigh. The processus vaginalis is divided just below the internal ring and the distal portion is not dissected from the cord. The tunica vaginalis is then sewn down to the fascia of the thigh, so as to hold the testis well down in the scrotum. No stitch is inserted into the testis which is left in the scrotum, but anchored by its tunica vaginalis.

This modification was employed as in the course of experimental work it was noted that the passage of a stitch through the tunica albuginea of the testis had an adverse effect on its histological appearance. In practice it has also been an improvement in that at the second stage the testis is left entirely free in the scrotum and shows no tendency to become adherent to the scar of the scrotal incision. It is true that by leaving the processus vaginalis, distal to the internal ring, in situ, the surgeon cannot gain extra length by a thorough dissection of the cord. This, in my opinion, is an advantage; as what the surgeon gains in length the testis loses in blood-supply. If operations are performed on properly selected cases there is seldom difficulty in placing the testis into the scrotum; should difficulty be found, it is better to adopt Cabot's suggestion of leaving the testis at the external ring and operating later to obtain the scrotal position.

By the adoption of the principles which I have outlined I believe that spontaneous descent will be a common event; that hormone therapy will be employed in suitable cases; and that operative treatment, though less often necessary, will show a high proportion of satisfactory results.

CONCLUSIONS

1. The causes of retention of the testis are developmental or mechanical, or both.
2. Management of retention of the testis depends on a correct assessment of the cause. This can best be made when the patient is approaching the age of 10.
3. Testes not mechanically retained will descend when development is adequate.
4. Development may increase either naturally or with the aid of hormone therapy.
5. Hormone therapy should be reserved for those in whom natural puberty development seems unlikely.
6. A mechanical cause of retention can only be overcome by operation; and satisfactorily overcome only if development is adequate.
7. Orchidopexy is best performed by the Keetley-Torek technique.
8. Both orchidopexy and hormone therapy, applied without proper indications, can do more harm than good.

I am greatly indebted to the surgeons of St. Thomas's Hospital for their kindness in referring patients to me, and especially to Mr. C. Max Page, under whose direction this work has been carried out on the surgical unit. I have had the greatest assistance in the histological and experimental side from Dr. D. C. L. Derry, pathologist to the unit, to whom I am most grateful.

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MEASUREMENT OF VITAMIN B_1 IN HUMAN URINE AS AN INDEX OF THE NUTRITIONAL LEVEL

FURTHER QUANTITATIVE DATA

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In earlier work (Harris and Leong 1936) it was shown that the amount of vitamin B_1 in urine could be conveniently measured by the "bradycardia" method, and that the level of excretion, as well as the response after a test dose, depended on the past intake of the vitamin. In vitamin-B_1 deficiency (including beri-beri in human beings and experimental polyneuritis in laboratory animals) the amount excreted fell to an almost negligible figure. It was suggested that the urine test could be used to assess the state of nutrition of the human subject with regard to vitamin B_1, and provisional standards were set out. Brief mention was made of surveys which were in progress on different classes of subjects, and the object of the present paper is to collect and analyse the data which have accumulated to date. As this is in the nature of an interim report fuller case-histories and detailed diet sheets will be postponed for a later publication.*

EXPERIMENTAL DETAILS

The following groups of subjects have been examined: (*a*) "normal controls"; (*b*) "surgical controls" (mostly poorly fed individuals from a hospital in a poor industrial area); (*c*) miscellaneous medical cases (from the same institution); (*d*) patients with polyneuritis held to be of nutritional origin; (*e*) patients with polyneuritis considered to be not primarily of nutritional origin; (*f*) cases of conditioned deficiency disease other than polyneuritis; (*g*) patients recovering from beri-beri.

The *normal controls* were mostly laboratory assistants or research-workers at the Nutritional Laboratory, Cambridge, but a number of subjects in London (office workers and laboratory assistants) and Singapore (research workers and laboratory assistants) were also included and found to give figures within the same limits. All were on their ordinary home diets during the period of the investigation.

The *surgical controls* were all taken from the surgical wards of a voluntary hospital in a large city in the north-east of England, and the *miscellaneous medical cases* and cases of *conditioned deficiency disease other than polyneuritis* as well as the cases of *polyneuritis* were from the medical wards of the same hospital (C.C.U. was responsible for the choice of cases in the last four groups and for providing the clinical histories; and P.C.L. carried out the urine analyses).

The cases of beri-beri were under treatment at the Tan-Tock-Seng Hospital, Singapore, the specimens of urine being placed at our disposal through the helpful collaboration of Prof. J. L. Rosedale.

In examining the urine of patients at a distance from Cambridge, the preliminary adsorption of the vitamin on acid clay, from the 24-hour specimen of urine, was carried out on the spot by the technique previously described. The activated acid clay was dried in a vacuum desiccator, and then dispatched by post to Cambridge where the tests on rats were performed (for details see Harris and Leong 1936).

Since our object in these experiments was not so much to obtain highly accurate values for given individual patients but rather to determine the *characteristic range of values* for the given groups, we have not always considered it necessary to examine more than one or two days' specimens from each case; and the assay has sometimes been limited to one or two rat-tests only on each such specimen. That this procedure has sufficed to give the information needed seems to be shown by the fact that, in the upshot, the various groups are each found to fall within fairly compact and distinctive limits.

TABLE I—NORMAL CONTROLS, CAMBRIDGE AND LONDON, MAY-OCTOBER, 1935

(Arranged in ascending order of resting levels)

Initials.	Occupation.	Urine tested (days).		Vitamin B_1 excreted (I.U.).	
		For resting level.	For test dose.	Resting level.	After test dose.*
A. W. D.	Lab. asst.	6	—	12	—
S. I.	"	11	1	13	36 (*b*)
T. W. B.	Res. worker.	4	1	14	44 (*h*)
S. A. C.	Lab. asst.	13	2	18	36 (*b*)
L. J. H.	Res. worker.	14	2	21	68 (*b*)
P. C. L. (1)	"	10	1	21	76 (*b*)
G. G. G.	Lab. asst.	11	2	22	47 (*b*)
P. C. L. (2)	Res. worker.	2	3	23	67 (*b*)
V. L.	Office worker.	4	—	27†	—
B. M.	"	4	—	35†	—

* In this and subsequent tables the following symbols are used to indicate the size of the test dose given: (*a*) = 300, (*b*) = 340, (*c*) = 350, (*d*) = 375, (*e*) = 400, (*f*) = 500, (*g*) = 525, (*h*) = 950 I.U. (international units).

† Diet contained proprietary wheat-germ preparation, rich in B_1.

RESULTS

The results for each of the separate groups are given in Tables I to IX. The final numerical conclusions are analysed in Table X and the results are summarised and arranged in order of magnitude in Table XI. A graphical presentation of the data (Fig. 1) shows clearly how the range of excretion varies from group to group.

CONCLUSIONS AND DISCUSSION

It will be observed (Fig. 1 and Table XI) that both in the "resting levels" and in the "responses to test doses" the same general order of descent is followed, as from one group to the next. Groups

* The present paper deals only with cases examined up to June, 1937. More recently a chemical process for estimating vitamin B_1 in urine has been under investigation by one of us (L. J. H.), and this alternative method may be expected to give results of higher precision—as well as effecting a considerable saving in labour. Since the present paper was prepared results in good agreement with the findings of Harris and Leong have been published in Holland by Westenbrink and Goudsmit (1937), who estimated the vitamin B_1 in urine chemically by means of the "thiochrome" reaction. (See also Helmer 1937, Karrer 1937, and Pyke 1937.)

with the lower average "resting levels" give the lower "responses," and vice versa. This confirms the reality of the differences between the various groups.

The "normal controls" (middle-class subjects) come first in the scale, with the highest range of excretion; and the "surgical controls" (poor working-class subjects) fall into the second place with a significantly lower range. At a still lower level are the various groups of medical cases: of these the lowest average values were for the cases of (*a*) "beri-beri under treatment," (*b*) "polyneuritis of nutritional origin," and (*c*) "other conditioned deficiencies." The separate groups may best be discussed in turn.

Normal controls.—These can be further subdivided into three sub-groups, examined at three different times (Tables I, II, and IX); two of these sub-groups consisted of subjects living at Cambridge or London, and one of normal individuals at Singapore. The range of values found has been approximately the same for each of these three sub-groups, the latest results obtained in 1937 confirming those previously reported for 1935. This agreement strengthens the belief in the reliability of the data for the "average" range of excretion.

Surgical controls.—The resting level of excretion of the so-called "surgical controls" was about one-third only of that of the normal subjects—viz., an average of 8 and a range of 4 to 12 as compared with an average of 22 and a range of 12 to 35 I.U. for the normals. We believe that this must be due very largely to the inferior diets on which most of these patients had previously been subsisting.

Still lower figures were found for the *miscellaneous medical cases* examined at the same institution (average 5, range 4 to 6 I.U.—i.e., about one-quarter of the values for the "normal" controls). In addition to the factor of poverty and unsatisfactory past diet, which operates to the same degree as in the surgical cases, the following additional causes may be instrumental in bringing about such lowered "reserves" in medical cases. (1) Anorexia accompanies many diseased states, and is responsible for a lowered total intake of food. (2) The hospital diets themselves sometimes contain meagre amounts of vitamin B_1, particularly, perhaps, those of the "bland

TABLE II—NORMAL CONTROLS, CAMBRIDGE AND LONDON, FEBRUARY-MARCH, 1937

(Arranged in ascending order of resting levels)

Initials.	Occupation.	Urine tested (days).	Vitamin B_1 excreted (I.U..) resting level.
S. A. C.	Lab. asst.	3	15
S. I.	"	2	17
A. W. D.	"	3	18
L. J. H.	Res. worker.	4	21
A. W.	Lab. asst.	3	21
M. A. A.	Res. worker.	2	23
P. C. L.	"	3	24
M. A. I.	"	3	25†
G. G. G.	Lab. asst.	3	33
B. O. Y.	"	2	35†

† Diet contained proprietary wheat-germ preparation, rich in B_1.

TABLE III—"SURGICAL CONTROLS," SEPTEMBER-DECEMBER, 1936

(Tables arranged in ascending order of resting levels)

Inits.	Occupation.	Diagnosis.	Diet.	Urine tested (days). For resting level.	Urine tested (days). For test dose.	Vitamin B_1 excreted (I.U.). Resting level.	Vitamin B_1 excreted (I.U.). After test dose.
Y. J.	Steel erector.	Fractured os calcis.	Hospital diet 12 days.	1	2	4·0	14 (*c*)
B. J.	Overman.	Torn cartilage.	Hospital diet 29 "	1	2	5·4	18 (*c*)
K. C.	Milk carrier.	" "	Home diet fair.	1	2	7·5	8·3 (*f*)
O. M.	Miner.	" "	Home diet "	1	2	7·8	20 (*f*)
M. A.	Labourer.	Fractured rib.	Home diet "	1	2	9·1	11 (*f*)
K. T.	Miner.	Fractured spine.	Home diet fairly good.	1	2	12	13 (*f*)

TABLE IV—"MISCELLANEOUS MEDICAL CASES," APRIL, 1936–JANUARY, 1937

M. J.	Musician.	Convalescent from pneumonia.	Hospital diet. 10 days.	1	—	3·6	—
E. M.	Housewife.	Carcinoma of stomach.	Hospital diet. 21 "	1	—	4·5	—
M. T.	Instructor.	General debility.	Hospital diet. 17 "	1	—	4·5	—
J. C.	Housewife.	Progressive muscular atrophy: syphilis.	Fair.	3	3	5·1	6·1 (*b*)
W. F.	Steelworker.	Fibrositis and sciatica.	Hospital diet 18 days.	1	—	5·9	—

TABLE V—CONDITIONED DEFICIENCY DISEASES OTHER THAN POLYNEURITIS, AUGUST, 1936–MARCH, 1937

W. M.	Housewife.	Atypical pernicious anæmia (and † subacute combined degeneration).	Good.	1	2	1·2	2·7 (*f*)
S. A.	"	Pernicious anæmia and subacute combined degeneration.	Moderate.	1	1	2·4	4·0 (*a*)
M. J.	Miner.	Pernicious anæmia.	Low.	1	2	2·7	5·4 (*d*)
J. J.	Gardener.	Sprue-like diarrhœa, and nutritional œdema.	Fair.	2	2	2·9	3·8 (*b*)
B. M.	Housewife.	Pernicious anæmia of pregnancy.	Low.	1	2	3·2	2·5 (*a*)
T. H.	"	Hypochromic anæmia (and † subacute combined degeneration).	"	3	3	3·5	7·3 (*g*)
E. C.	Miner.	Idiopathic hypochromic anæmia.	—	1	1	3·8	4·0 (*c*)

TABLE VI—POLYNEURITIS, "NOT PRIMARILY NUTRITIONAL," MARCH, 1936–FEBRUARY, 1937
(Tables arranged in ascending order of resting levels)

Inits.	Occupation.	Diagnosis (apart from polyneuritis).	Nervous lesion.	Diet.	Urine tested (days).		Vitamin B_1 excreted (I.U.).	
					For resting level.	For test dose.	Resting level.	After test dose.
P. H. A.	Ex-clerk.	Gout.	Foot-drop.	Low.	3	3	1·2	3·0 (*f*)
P. F.	Publican.	Nephritis, uræmia (terminal).	Wrist-drop.	Good.	3	3	1·8	2·8 (*b*)
M. J.	"	Hypertension.	Wrist-drop (2 years).	Fair.	3	3	1·9	10 (*f*)
C. H.	Saddler.	Progressive polyneuritis.	Upper and lower limbs.	Moderately good.	1	2	3·5	11 (*b*)
S. W.	Old age pensioner.	Diabetes.	Jerks absent.	Low.	3	3	4·3	11 (*b*)
C. G.	Woodman.	Lead neuritis and anæmia.	Finger-drop.	Fair.	3	3	4·6	10 (*f*)
O. G.	Brewers' drayman.	Local neuritis, hypertension, gastritis.	Wrist-drop (2 years).	"	1	2	5·7	6·3 (*f*)
E. W.	Grocer	Diabetes, pulmonary tuberculosis.	Wrist-drop, foot-drop.	Good.	2	3	11	18 (*f*)

TABLE VII—POLYNEURITIS "OF NUTRITIONAL ORIGIN" MAY, 1936–JANUARY, 1937

P. S.	Cycle-maker.	Faulty gastro-enterostomy with stasis.	Severe generalised polyneuritis with amnesia.	Very low.	1	2	0·4	0·6 (*b*)
C. J. B.*	Housewife.	Alcoholism with Korsakoff's syndrome.	Foot-drop, mental changes.	Low.	1	1	0·8	2·4 (*f*)
N. C.	Turner.	Gastro-enterostomy, hypochromic anæmia.	Loss of knee- and ankle-jerks.	Moderate.	1	2	1·6	9·8 (*f*)
H. A.	Housewife.	Polyneuritis of pregnancy.	Wrist- and foot-drop, &c.	Low.	2	2	1·8	2·3 (*e*)
B. G.	Miner.	Carcinoma of stomach, pyloric stenosis, gall-stones.	Chiefly peronei.	"	1	2	3·6	4·4 (*b*)
(G. J.)	(Seagoing.)	(Gastric ulcer, convalescent after beri-beri.)	(Had had beri-beri in far East.)	"	(1)	2	(6·0)†	2·1 (*b*)

* Incontinent; urinary excretion of B_1 calculated for 1500 c.cm.
† Value after recovery; not included in calculations and summaries.

non-irritating" type.† (3) In some instances, especially in gastro-intestinal disease, faulty absorption or assimilation of the vitamin may also have to be reckoned with. (4) Particularly when there is fever, the raised metabolism, and wasting of body tissues probably entail an increased destruction of vitamin B_1 (the same is true of other dietary essentials, certainly of vitamin C,‡ and probably of vitamin A).

This finding of a low value for the vitamin-B_1 "reserves" in many medical cases seems to be one of the most significant findings in the present work. Taken with the results of earlier investigations on vitamin C, and also on vitamin A, it suggests that a condition of multiple *partial* vitamin-deficiency is not infrequently associated with the state of poor nutrition characteristic of so many diseased states. The need for more special attention to be devoted to specific vitamin requirements during disease and in convalescence will assuredly be recognised more and more as time goes on.

Polyneuritis and certain "conditioned deficiency diseases."—The lowest average ranges of values among the various patients examined in this country were those in the groups described as polyneuritis of nutritional origin, the excretions being as low as those found in cases of beri-beri undergoing treatment at Singapore. The typical resting level of excretion was less than one-tenth of the normal figure—viz., below 2 as compared with 22 I.U. Values nearly as low were found in "other conditioned deficiencies," as well as in several cases of "polyneuritis not considered to be primarily of nutritional origin."

It seems very significant that values below about 3·5 I.U. (resting level) were found only in cases of beri-beri, "polyneuritis of nutritional origin" and "other conditioned deficiencies" and were not seen in the other groups (apart from three out of eight cases of polyneuritis which *on clinical grounds* had been considered to be "non-nutritional"). All the cases of beri-beri examined, all those of "nutritional polyneuritis," and all the "conditioned deficiencies" fell into place *below* this arbitrary border-line (or on it), whereas all the normal controls, all the surgical controls, and the "miscellaneous medical cases" were *above* it (see Fig. 1).§

We do not pretend to attach any absolute numerical significance to this figure of 3·5, and quite possibly more precise determinations than we have so far attempted will bring with them the need for some revision of its actual magnitude; but none the less, in a general qualitative way, the division of cases seems unmistakable. Similarly with regard to test doses, negligible responses were the usual feature of the cases of nutritional polyneuritis and "other conditioned deficiencies," but not of the other groups. (This is better shown in Fig. 2.)

A further point of importance seems to be that the characteristic excretions for "other conditioned

† The usual hospital diet, in the present instance, had the following composition:—
Breakfast: bread and butter; tea; one egg occasionally.
10 A.M.: soup or Bovril.
Noon: meat and potatoes, and rice pudding; sometimes fruit; fish is given on Friday instead of the above.
4 P.M.: bread and butter; tea; sometimes an egg; biscuits and possibly cake.
6 P.M.: milk, ½ pint.
8 P.M.: lemonade.
We have calculated that this contains considerably less than the reputed "desirable intake" of 600 I.U. per day (see later footnote in section headed "Standards").

‡ See papers by Abbasy, Harris, and Gray Hill 1936, 1937; Abbasy, Harris, and Eilman 1937; Harris, Passmore, and Pagel 1937.

§ It may be noted that the proportion of cases actually on or near this arbitrary border-line is not sufficient to invalidate the argument—viz., 0 out of 23 for the "normal controls," 0 out of 6 for the "surgical controls," 1 out of 5 for the "miscellaneous medical cases" (*otherwise all the foregoing are well above 3·5 I.U. per day*); 1 out of 5 for the "nutritional polyneuritis," 0 out of 7 for the "beri-beri," 3 out of 7 for other "conditioned deficiencies" (*others all well below*); and 1 out of 8 for "non-nutritional polyneuritis" (otherwise 4 are above and 3 are below).

TABLE VIII—BERI-BERI DURING TREATMENT (SINGAPORE), SPRING, 1936

(Arranged in ascending order of resting levels)

Init.	Urine tested (days).	Vitamin B_1 excreted (I.U.), resting level.
B	5	1·2
D	5	< 1·6
C	5	< 1·8
F	5	2·0
G	5	2·6
A	5	2·9
E	5	3·0

TABLE IX—CONTROLS TO BERI-BERI CASES (SINGAPORE), SPRING, 1936

Init.	Occupation.	Urine tested (days).	Vitamin B_1 excreted (I.U.), resting level.
AA	Lab. asst.	3	12
BB	"	3	14
CC	Res. worker.	3	17

deficiencies"—i.e., without symptoms of polyneuritis—while very low, were not quite so low as for definite symptoms of "polyneuritis of nutritional origin"—of the latter all but one fell below 2 I.U. daily and of the former all but one above 2 I.U. daily. The average for the "other conditioned deficiencies" was 2·8 I.U. and that for "nutritional polyneuritis" only 1·6 I.U.

The relatively low figures for "other conditioned deficiencies" might perhaps have been anticipated—since a condition causing faulty absorption or utilisation of one factor will probably interfere to some extent with that of others. One has only to recall that alcoholism may be the cause both of pellagra and of vitamin-B_1 deficiency, and that achlorhydria often produces unsaturation with respect to vitamin C as well as other symptoms of deficiency, to realise that conditioned partial deficiencies are likely to be multiple.

The results with "non-nutritional" polyneuritis need rather more careful discussion:—

CLASSIFICATION OF VARIOUS TYPES OF POLYNEURITIS

Recent work goes to show that polyneuritis as a result of a dietary or "conditioned" deficiency of vitamin B_1 may occur in alcoholism (Strauss 1934, Jolliffe et al. 1936), and in pregnancy (Strauss 1934, Fouts et al 1934, Sze 1934, Theobald 1936, Widenbauer 1936), and probably in certain other conditions. The syndrome has followed prolonged anorexia, vomiting and diarrhœa in a patient with pernicious anæmia (Ungley 1938), and has been observed as a complication of certain gastro-intestinal disorders—where absorption or utilisation of the vitamin is probably at fault. The cases here described as "probably of nutritional origin" appeared clinically to fall into this classification—i.e., as due to dietary and/or "conditioned" deficiency—and the low values for vitamin-B_1 excretion accord with this impression.

A noteworthy finding is that several of the cases of polyneuritis in the group classified on clinical grounds as "not primarily of nutritional origin" gave as low values as certain of those in the group just mentioned which were considered to be "probably of nutritional origin." One might be tempted to suggest, on the basis of this finding, that the conception of a conditioned deficiency of vitamin B_1 may need extending, and that perhaps a greater number of cases of polyneuritis are due fundamentally to a conditioned or secondary deficiency than is now generally recognised. Arguments could be advanced both for and against this view. Thus on the one side it may be recalled that Vorhaus, Williams, and Waterman (1935) in their recent work on the treatment of neuritides with massive doses of vitamin B_1 claim to have effected cures in many types of neuritis which according to current ideas would not be accepted as related to vitamin-B_1 deficiency. Again, Ritchie Russell (1936) noted improvement in a case of chronic progressive polyneuritis treated with injections of vitamin B_1.

TABLE XI—SUMMARY OF REPRESENTATIVE VALUES

(Arranged in descending order)

—	—	Average amount of vitamin B_1 excreted (I.U.) per day (with range of values).	
		Resting level.	After test dose.
1	Normal controls.	20 (12–35)	50 (36–76)
2	"Surgical controls" (poor class, industrial area).	8 (4–12)	14 (8–20)
3	"Miscellaneous medical cases."	5 (4– 6)	—
4	Polyneuritis, "not primarily nutritional."	4 (1–11)	9 (3–18)
5	Conditioned deficiency diseases other than polyneuritis.	3 (1– 4)	4 (3– 7)
6	Polyneuritis "of nutritional origin."	2 (0·4– 4)	3 (0·6–10)
7	Beri-beri under treatment.	2 (1– 3)	—

On the other side of the argument, however, there are certain facts to be borne in mind. For example, the "non-nutritional" cases of polyneuritis—in the present series at least—presented clinical pictures distinctly different from those generally found in "nutritional" polyneuritis, and it would require strong evidence to convince the clinician that vitamin-B_1 deficiency played a part in their causation. Again, the excretion of vitamin B_1 in these cases was not on the average significantly different from that in the "miscellaneous medical cases"—although it is true that in at least three cases it fell to a level which has only been found otherwise in association with beri-beri, nutritional polyneuritis or "other conditioned deficiencies." This latter observation raises the difficult question of standards, which is discussed further below. It will be understood in the meantime, however, that while "normal" figures for urinary excretion are strong evidence against the existence of vitamin-B_1 deficiency, low figures afford no justification in themselves for

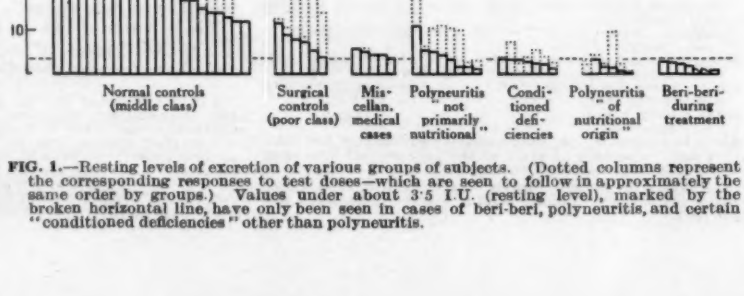

FIG. 1.—Resting levels of excretion of various groups of subjects. (Dotted columns represent the corresponding responses to test doses—which are seen to follow in approximately the same order by groups.) Values under about 3·5 I.U. (resting level), marked by the broken horizontal line, have only been seen in cases of beri-beri, polyneuritis, and certain "conditioned deficiencies" other than polyneuritis.

concluding that the disease from which the patient suffers is necessarily the result of the vitamin-lack. A final difficulty is that even when improvement of symptoms and signs are seen in a patient suffering from polyneuritis during the treatment with vitamin B_1, this is not necessarily in itself evidence that the condition is related to vitamin deficiency; for it is characteristic of polyneuritis that it tends to improve spontaneously. If, after a suitable control period during which improvement has been slight or absent (as in the tests of Vorhaus et al. 1935), the administration of vitamin B_1 is then followed by a rapid and dramatic effect, one may be justified in drawing tentative conclusions. Unfortunately, unlike certain other workers, one of us (Ungley 1937) has rarely observed such clear-cut effects from vitamin-B_1 therapy. Even cases which were considered clinically to be nutritional in origin have often improved only very slowly, despite the prolonged administration of vitamin B_1 by mouth and by injection (500-5000 I.U. daily). The slow response may possibly have been partly due to the severity and duration of the lesions in the peripheral nerves or to deficiency of factors other than vitamin B_1. But in view of the known tendency of polyneuritis to improve spontaneously this lack of dramatic effect rendered it extremely difficult to assess the value of the treatment. Obviously much further work is necessary before the rôle of vitamin-B_1 deficiency in various types of polyneuritis can be accurately assessed.

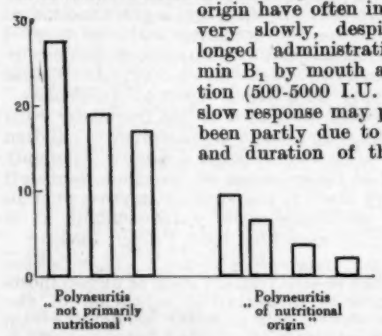

FIG. 3.—Excretion of vitamin B_1 after continuous treatment with massive doses of the vitamin. Comparison of "nutritional" and "non-nutritional" polyneuritis.

Probably one method of attacking the problem is to compare the excretion of vitamin B_1 after intensive treatment with the vitamin. In cases of polyneuritis of a truly nutritional origin, especially when there is a state of conditioned deficiency arising from faulty absorption or utilisation, a long delay in the attainment of a normal rate of excretion may reasonably be expected. Work of this kind is now in progress, and the preliminary results seem very suggestive. Thus, in two cases of polyneuritis held to be of nutritional origin, and also in one case of a conditioned deficiency disease (sprue-like diarrhœa) there was a complete failure to reach a normal rate of excretion even after several weeks of treatment. In marked contrast, three cases of polyneuritis "not primarily nutritional" showed normal excretion after treatment. Admittedly the actual doses given and the time of treatment were not strictly comparable (see Table XII), but there appears to be no question of the difference in response between the two groups (Fig. 3). It seems therefore that a useful method of attack on the problem for the future will be to compare the effects of repeated test doses ("saturation" tests) on the various types of polyneuritis. Where faulty absorption is suspected to be the cause of conditioned deficiency, the effects of the vitamin given by mouth and by injection should also be compared.

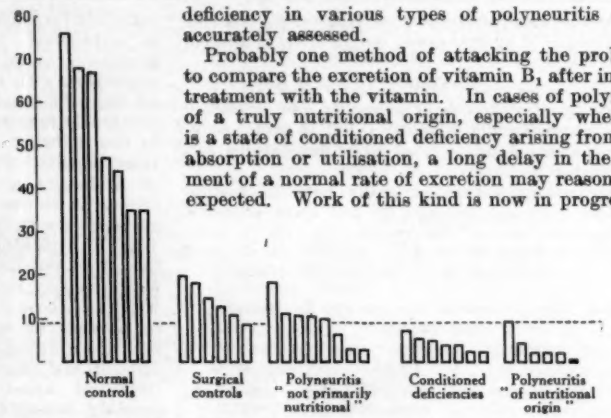

FIG. 2.—Effect of test doses "arrayed" in order for the different groups (cf. Fig. 1).

Even with the cases of "non-nutritional" polyneuritis (Table XII) the final rate of excretion seems less high than might normally have been anticipated, considering the extremely intensive nature of the treatment. It may be that later work will show that the difference between "nutritional" and "non-nutritional" polyneuritis is sometimes one of degree rather than of kind.

TABLE X—ANALYSIS OF RESULTS

Cases examined.		Description.	Excretion of vitamin B_1 (I.U. per day).					
			Resting level.			After test dose.*		
For resting level.	For test dose.		Range.	Median.	Average.	Range.	Median.	Average.
10	7	Normal controls, Cambridge and London, 1936.	12–35	21	21	36–76	47	52
10	0	" " " " 1937.	15–35	22	23	—	—	—
3	0	" " Singapore, 1936.	12–17	14	14	—	—	—
6	6	"Surgical controls" (poorer diet), 1936–37.	4–12	8	8	8–20	13	14
5	1	"Miscellaneous medical cases."	4– 6	5	5	6	—	—
8	8	Polyneuritis, "not primarily nutritional," 1936–37.	1–11	4	4	3–18	10	9
7	7	Conditioned deficiency diseases (not including polyneuritis).	1– 4	3	3	3– 7	4	4
6	6	Polyneuritis "of nutritional origin."	0·4– 4	2	2	0·6–10	2	3
7	0	Beri-beri undergoing treatment.	1– 3	2	2	—	—	—

* As the responses were of the same order for the several levels of test dose, they are not indicated separately.

The significance of subnormal vitamin-B_1 reserves in the absence of symptoms of polyneuritis is alluded to again below.

STANDARDS

The fixing of *standards of normality and deficiency* is attended with some difficulty; but it would seem that the following provisional recommendations can be justified.

Determinations should be made both of resting level (based on an average of 2–3 days separate determinations) and of the response to two or more standard test doses of 350 I.U.—i.e., for an adult of 10 st. body-weight, and in proportion for children.

TABLE XII—EXCRETION OF VITAMIN B_1 DURING TREATMENT

Init.	Diagnosis.*	Treatment: Daily dose, how given, duration.	Daily excretion after treatment (I.U. per day).
M. J.	Polyneuritis not primarily of nutritional origin.	1000 I.U., injection, 2 months.	17
P. H. A.		500 + 500 I.U., injection + mouth, 3 months.	19
O. G.		Bemax 60 g., mouth, 2½ weeks.	27
P. S.	Polyneuritis of nutritional origin.	500 I.U., injection, 5 weeks.	3·6
B. G.†		500 I.U., injection, 6 weeks.	6·6, 8·4
J. J.‐	Sprue-like diarrhœa.	Marmite 60 g., mouth, 11 weeks.	2·2

* For further details see Tables V, VI, and VII.
† Twenty-five injections given in 6 weeks.

Standards of normality.—Judging from the numerous normal controls whom we have examined, it may be concluded that a resting level of from 10–20 I.U. and a response of upward of 30 I.U. after the first test dose imply average normal nutrition with regard to vitamin B_1. A resting level of less than 10 I.U., or an excretion of less than 15 I.U. after test dose, may be classified as subnormal, on the grounds of being sufficiently far removed from the average normal range of excretion, also as being below the excretion known to correspond with the generally accepted values for an optimum intake of vitamin B_1.‖

Our results show further that the cases of nutritional polyneuritis and beri-beri have had excretions of about 3·5 I.U. or below for their "resting levels" (as compared with values of 12–30 for the normals). It will be seen moreover that the cases of "nutritional polyneuritis" with one exception gave a negligible response to a test dose (and that in this one exception the response was below 10 as against a response of 35–75 in the normals).

Nevertheless, no sharp dividing line can yet be drawn between the level at which neuritic symptoms may appear and that judged to be just adequate for protection. In fact it is possible that no very sharp line exists. Certainly with experimental animals the dividing line is vague—that is, only a proportion of animals will develop definite polyneuritic signs on a diet partially deficient in the vitamin. In case it might be argued that a standard for subnormality such as we have suggested is unjustified, when no clearly defined clinical symptoms or more obvious ill effects are necessarily associated with it, the following consideration must be kept in mind. In the first place, it has been repeatedly found in animal experiments that increases in the allowance of vitamin B_1 to levels far above those needed for protection against actual symptoms of a deficiency disease still produce a beneficial effect, as shown by improved growth-rate, weight gains, longevity or physical performance. For example 1–2γ of crystalline vitamin B_1 per day will protect rats from polyneuritis, but increases of 1–100 times this quantity induce progressively greater gains in weight. Secondly, tests on human beings (mostly on infants or children) have repeatedly indicated that the addition of extra vitamin B_1 to an "average" institutional diet brings about such benefits as improved appetite, increased weight gains, and possibly strengthened gastro-intestinal tone, even when no apparent disease was associated with the lower intake (see Daniels et al. 1922, Bloxsom 1929, Gayner and Dennett 1934, Dennett 1929, Cowgill 1932, Hoobler 1931, Summerfeldt 1932, Ross and Summerfeldt 1935, Crimm et al. 1933, Brown et al. 1934). Hence, whenever the urinary excretion indicates that the dietary intake of a given individual is below the figure corresponding with the reputed optimum, one seems justified in applying the description subnormal to such an individual. Similar conditions apply with other "partial deficiencies." For example with vitamin C it has frequently been shown that the symptoms of latent scurvy in children are so vague as to be difficult of diagnosis; the only certain proof of the existence of (and importance of) the sub-scurvy state is the striking improvement in growth and well-being when extra vitamin C is given (see, e.g., Friderichsen 1934, Frölich 1935).

Standards for "marked deficiency."—There seems little doubt that in an advanced state of avitaminosis the most accurate quantitative indication of the extent of the deficit can probably be obtained by determining the number of repeated test doses which have to be given before the subject finally reaches a state of *stable* saturation at a normal level of excretion (cf. Harris and Leong 1936). This technique follows that used for the determination of vitamin-C deficiency (see Harris and Ray 1935, Harris 1935, Abbasy, Harris, and Gray Hill 1937, &c.). As has been pointed out above, it seems significant that in polyneuritis of nutritional origin, every case but one gave a negligible response (and this one case was below the minimum level of 10), while in non-nutritional polyneuritis higher responses were generally seen (Fig. 2). The difference is more clearly shown after repeated doses (see Fig. 3). More work will be needed before these detailed numerical relations can be put on a strictly quantitative basis. As we said at the beginning of this paper our object here has been rather to obtain "round values" characteristic of the several groups. While therefore some uncertainty still remains as to the total extent of the deficit which may be met with in cases of advanced deficiency—i.e., as measured by the degree of unsaturation with repeated test doses—we are certainly entitled to conclude that subjects having an excretion of upwards of 10 I.U. (resting level) and a normal response to test dose may safely be regarded as free from deficiency.

Resting level for "marked deficiency."—As previously noted, almost without exception, cases of beri-beri, polyneuritis of nutritional origin and "other conditioned deficiencies" have shown *resting levels* of 3·5 or below, while the normal controls, surgical controls, and "miscellaneous medical cases" have been above this arbitrary standard. A few cases of polyneuritis which had been adjudged clinically

‖ For calculations as to the probable optimum vitamin-B_1 requirements of man see Baker and Wright 1936; Baker, Wright, and Drummond 1937; Cowgill 1921; Jung 1932; Salter 1934; Géronne 1934; Jusatz 1935. Baker, Wright, and Drummond 1937, after a careful consideration of past clinical literature, consider the "physiological minimum" to be 300 I.U. per day. This corresponds according to our experiments with an excretion of approximately 20 I.U. (see Harris and Leong 1936). The "desirable intake," however, according to these authors, is 600 I.U. daily; at this rate of intake the excretion is about 40 I.U. daily (Harris and Leong 1936).

to be of non-nutritional origin were below and the remainder were above this presumptive border-line. Further tests are needed to see how far this provisional figure can be applied as a consistent standard.

A still more stringent standard—viz., *under 2 I.U.*—would have the advantage of including (with one exception) all the cases of polyneuritis of nutritional origin while excluding (with one exception) all those of conditioned deficiencies not accompanied by actual symptoms of polyneuritis.

SUMMARY

In continuation of earlier work (Harris and Leong 1936), in which it was shown that the excretion of vitamin B_1 was graded according to the past dietary intake, further data are given for various classes of subjects.

Normal well-nourished controls—middle-class persons at Cambridge, London, and Singapore—excreted on the average about 20 I.U. per day (average 22, range 12–35 I.U.)

A group of "surgical" cases, who came from a lower social class in a poor industrial area and most of whom were known to have been on diets low in vitamin B_1, excreted only one-third of the above "normal" figure (average 8, range 4–12 I.U.).

Somewhat lower values still were seen in a group of miscellaneous medical cases (average 5, range 4–6).

The lowest figures of all—viz., excretions of 3·5 I.U. *and under*—were the cases of (*a*) beri-beri, and (*b*) polyneuritis of nutritional origin (average 1·6), and the next lowest those of (*c*) other conditioned deficiencies (average 2·8). Low values were also seen (*d*) in a proportion of the cases of polyneuritis which had been judged on clinical grounds to be not primarily of nutritional origin.

Responses to test doses were approximately parallel with the "resting levels" and served to confirm the separation into the foregoing categories.

It is concluded that the urinary excretion furnishes a useful guide to the state of nutrition of the subject with regard to vitamin B_1.

The low values so often found in medical cases may probably be attributed to one or more of the following causes: (*a*) anorexia, (*b*) poor hospital diets, (*c*) raised metabolism (especially in fever) and wasting of body tissues, (*d*) faulty absorption or utilisation. The importance of providing specially nourishing food during illness and convalescence is emphasised by these results.

The following provisional standards are suggested—

A "resting level" of excretion of 10–20 I.U. and a response of upward of 30 I.U. after the standard test dose (350 I.U.) implies average normal nutrition. Excretions of less than 10 I.U. (resting level) and 15 I.U. (after test dose) seem sufficiently removed from the average range, or from the excretion corresponding with the *reputed optimum requirements*, to be classified as subnormal. Polyneuritic symptoms of nutritional origin have been found to be associated with resting levels of 3·5 I.U. and under (or below 2 I.U. in 4 cases out of 5), and with low responses to test doses.

Probably with the more advanced state of avitaminosis, the most accurate indication of the degree of the deficit can be obtained by a determination of the number of repeated test doses which are needed before "saturation" is finally brought about at the normal level.

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(*Continued at foot of opposite column*)

A CASE OF ONCHOCERCIASIS (FILARIAL BLINDING)

WITH MANIFESTATIONS DEVELOPING IN BRITAIN

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CASE REPORT

IN December, 1936, an application was received from a man aged 34 for admission to the ward of the Liverpool School of Tropical Medicine. He complained of eye trouble which he said developed in 1934, shortly after his return from a sojourn in Africa. On his entering hospital the following material facts relating to his peregrinations and history were obtained. He was vague about dates in several details, and he even found considerable difficulty in accounting for periods of time up to a whole year; but by cross-checking information obtained from other sources a fairly reliable sequence of events was ultimately established.

PREVIOUS HISTORY AND MEDICAL HISTORY

He was born in England in 1903, and educated in this country. He spent 1925–27 in Canada and Australia, returning to England. In 1929 he travelled to Cape Town by sea, and then to Northern Rhodesia, stopping at various places en route. He was employed in a mine in Northern Rhodesia near the Congo border until January, 1931, when he travelled north by car along the Congo border to Tanganyika; during this trip he often went over the border into the Congo at the week-ends on shooting expeditions. He then went through Kenya, and started prospecting to the north of Kisumu. In January, 1934, he set out for Europe by car via the Sudan, Egypt, Palestine, Turkey, along the Danube to Germany, finally reaching England in June, 1934.

Close inquiry into his medical history yielded the following relevant information. June, 1930–January,

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1931: While working on the mines he was continuously on night-shift, which he thinks did not suit him. He lost weight and condition, and developed persistent "veld sores" on both legs. He also fell about 180 ft. down a steep incline and was cut about the head. The wounds refused to heal, and this fact, together with the "veld sores" and his general ill health, determined him to start his trading venture along the Congo border. He rapidly recovered his health at this work, and the sores and festering wounds healed in a short time.

May, 1932: When prospecting in Kenya he was reduced to very low financial circumstances, and "lived native" for about a year. His diet consisted of beans, green bananas and sweet potatoes, and a small quantity of meat once a week. He was fit throughout this period, but towards the end of it he developed "veld sores" which became infested with "fly maggots." He removed these mechanically and the sores quickly healed. While on this native diet he suffered at times from some attacks of acute abdominal pain which doubled him up, but these attacks lasted only some hours.

April, 1933: As a result of hard physical work on a mine he began to lose condition again, and developed further "veld sores." He also had an attack of what he called "scurvy," but there seems little doubt that the infection was scabies. Shortly after this he had an attack of malaria, for which he was treated with quinine, and he was also given three injections of Fourneau 914 as a tonic and for his "veld sores," which were still troublesome.

January, 1934: He set out for Europe with some companions by car. In Egypt he had an attack of what clinically seems to have been bacillary dysentery, which lasted ten days. While near the Mediterranean coast he decided to take a trip to Cyprus, and during his stay there, while he was sitting on the shore watching for a boat with his companions, he noticed that he could see better with one eye than with the other; but he attached no significance to this.

June, 1934: On his arrival in England, a relative drew attention to the fact that his eyes were bloodshot. He attributed this to wind and sun on the journey, but the condition failed to clear up as he had expected. Within a few weeks he was conscious of some difficulty in looking upwards, as the light hurt his eyes, and about five weeks after his arrival he was troubled with pain and watering in the left eye, which he thought was due to the presence of some foreign body. For a week he had pain and discomfort, which became worse; and the other eye then began to trouble him.

August, 1934: Examination of an object visually caused smarting in the eyes and lacrymation; reading became impossible for long periods, and there was much photophobia. He became seriously alarmed and consulted an ophthalmic surgeon, who has kindly informed me that at this time there was keratitis of both eyes and numerous spots on each cornea, which did not seem greatly to interfere with vision. General treatment was given, which afforded some temporary relief.

September, 1934: Acute abdominal pain and a diagnosis of appendicitis led to admission to a London hospital, where the vermiform appendix was removed. During convalescence his vision began rapidly to fail, and he noticed that he could no longer read the numbers over the beds on the other side of the ward, which had been decipherable on his admission. He could not read news-print for more than a few seconds at a time and photophobia became severe. He could not tolerate a light near his eyes, even with the lids shut. Any attempt to look upwards caused him extreme pain and discomfort, and his eyes were acutely injected and inflamed. On leaving this hospital, he sought advice from various ophthalmic surgeons, without other than temporary relief; but the exceedingly acute inflammatory state of his eyes gradually subsided to a subacute and, later, chronic condition.

January, 1935: An attack of fever led to admission to a hospital for tropical diseases, where he was found to have simple tertian malaria. This was treated; and while in this hospital it was found that he was infested with *Ascaris lumbricoides*, half a dozen worms being removed by an anthelmintic. The eye condition was attributed to some nutritional factor, and measures considered appropriate were taken to relieve it, without much effect.

April, 1935: In view of the persistence of the eye discomfort he again sought admission to hospital, and a skin test for filariasis gave a doubtful positive reaction. A complement-deviation test for filariasis showed that his serum at that time fixed 20 minimum hæmolytic doses of complement against a filarial antigen. The Wassermann reaction was negative; no parasites of any kind were found.

May, 1935: A hæmatologist examined him and discovered a 40 per cent. eosinophilia; while under his care the patient had a transient swelling over the right shoulder, the size of a pigeon's egg, which lasted only about twenty-four hours. A tentative diagnosis of filariasis was made from this, and he was put on a course of Neostibosan, with a total dosage of 9 grammes. This, I am informed, caused the eosinophilia to drop to about 5 per cent., and the patient is very positive that after the third injection of the course the eye condition rapidly started to improve, and that he was able to visit a cinema and enjoy the performance for the first time for many months. The drop in the number of eosinophils, however, proved to be only temporary, and the percentage steadily rose until it reached the original figure within a few weeks. The eyes, although no longer acutely painful and inflamed, remained defective in vision, and the patient then began another round of ophthalmic surgeons, both in this country and on the Continent, without either a definite diagnosis being reached or any material benefit resulting. He approached this institution as one of the few he had not already consulted.

PHYSICAL EXAMINATION

In January, 1937, he was admitted to the tropical ward of the Liverpool School of Tropical Medicine.

He was a robust, muscular, and intelligent man of equable temperament. His general physical condition was excellent. On full clinical examination nothing abnormal was found, with the exception of eye lesions and a high eosinophilia. No malaria parasites were seen in the blood; the spleen was not enlarged; no parasites of significance were found in the stools; the urine was normal; and no calcified patches could be seen in the musculature on X ray examination. The Wassermann reaction was completely negative. On most careful and repeated search, both by the patient and his attendants, no skin lesions or subcutaneous nodules were found.

Blood.—Several counts were made, and the following figures are those obtained by averaging three counts done on one day:—

Hæmoglobin	90%	White cells	6800
Red cells	5,300,000	Polymorphs	33·3%
Colour-index	0·85	Lymphocytes	30·0%
Halometer size	7·02μ	Monocytes	3·3%
		Eosinophils	33·0%
		Basophils	0·3%

No abnormal cells were found. There was a slight degree of hypochromia of the red cells.

Eyes.—Mr. McKie Reid was asked to examine the eyes, and reported that there were areas of opacity in both corneæ, that these areas were small and multiple, and that they were situated over the pupillary apertures. The visual acuity of both eyes was obviously affected.

Specific examination.—Repeated investigation of the nocturnal and diurnal blood by various methods, including the centrifuging of considerable volumes, failed to yield any microfilariæ. Mr. McKie Reid was asked to remove a small piece of the bulbar

conjunctiva of the left eye, and in this were seen nine microfilariæ, which on staining proved to be larval *Onchocerca volvulus*. Some four dozen snippings of skin from the face, neck, shoulders, and chest were examined at various times, and in three of these similar larvæ were found. Two were recovered from the right arm, and a single larva from the skin of the left side of the chest. Mr. McKie Reid was then asked to remove some aqueous fluid from the anterior chamber of one eye, and withdrew about 0·25 c.cm.; no parasites were found in it. Examination on two occasions with the slit-lamp showed parasites in small numbers, but a feature of this examination was the remarkable rapidity with which the larvæ removed themselves from the bright light required for the apparatus. Those seen could only be observed for a few seconds before they left the range of vision into the surrounding tissues with the greatest activity.

PROGRESS

The patient was in hospital under observation for about six weeks. Under simple palliative treatment by the eye surgeon, the ophthalmic condition improved steadily, and vision became more distinct. He left hospital, and nothing further was heard of him until October, 1937, when he was readmitted for a week for re-examination. At this time he appeared in robust general health, and his eyes were again examined by Mr. McKie Reid, who found that there was further improvement in visual acuity. Both eyes looked clear on ordinary examination, but slight opacity could be seen under proper illumination. With the slit-lamp no larvæ could be found, but snippings of both conjunctivæ yielded two or three. A few were also recovered from skin snippings from the arms and shoulders. The eosinophilia was about 32 per cent.

The finding of the larvæ, and their identification, established beyond doubt the nature of the condition; and a study of the published work on onchocerciasis emphasises the interest of the case, and the possibility of the occurrence of similar cases in Europe. So far as I have been able to find, the present is the first case of this nature to be recognised and recorded in this country.

OBSERVATIONS ON THE DISEASE

Onchocerciasis is a form of filariasis known to occur in West Africa, the Congo, Uganda, the Sudan, the Cameroons, and Senegal. It also is found extensively in Central America and the adjoining parts of the North and South American continent. Flies of the genus *Simulium* (buffalo gnats, black flies, &c.) are the vectors of the parasite, and these insects breed in swiftly flowing waters. From 40 to 100 per cent. of the population of the endemic areas have variously been reported as infected with *O. volvulus*, and the infestation is usually associated with fibrous nodules in the subcutaneous tissues, either single or multiple, which are present more particularly over bony parts of the body. These nodules each contain several adult worms of both sexes; the gravid female worms give birth to larvæ that migrate from the tumours to the superficial layers of the skin, from which they may be recovered in thin shavings of the epidermal layers. They are particularly numerous around the tumours, but wander widely over the body and can be found in lesser numbers some considerable distance away from them. Puncture of a nodule and aspiration of tissue fluid from it is a means of obtaining large numbers of larvæ.

In Central America it was found that onchocerciasis was extensively associated with blindness, and that in that part of the world the nodules occurred in over 90 per cent. of all cases on the scalp. In Africa nodules are rarely met with on the head; the vast majority being found at a level below the shoulders. The Central American parasite is there popularly known as the "blinding filaria," and has been given the name *Onchocerca cæcutiens* by Brumpt; but, as the belief is now general that there is no specific morphological or biological difference between *O. volvulus* of Africa and *O. cæcutiens* of America, the latter name has been dropped. Where there are nodules on the upper part of the body, especially on the head, the microfilariæ are liable to invade the eye tissues and give rise to eye defects and blindness. That this is the case in Africa as well as in America has been shown by observations made by Hissette (1932) in the Katanga province of the Belgian Congo. He observed that in certain districts onchocercial head nodules were common and that these were associated with blindness. He believed the causative parasite to be the usual African *O. volvulus*, and his findings were subsequently confirmed and extended by the members of an expedition from Harvard University, who had already investigated the situation in Guatemala (Strong and others 1934). The members of this expedition had already noted in America that in a certain small proportion of cases of onchocerciasis there was no demonstrable nodule formation. These they had referred to as carriers, but they also noted that some of them developed eye changes. Hissette records, however, that in almost every case which he has seen in Africa he has on very careful search been able to find some nodules; but that these may be exceedingly small (0·82–2·5 mm.) and therefore readily overlooked. He also confirmed the previous workers' observation that the great majority of those persons with eye changes have nodules on the head region. By all workers it is agreed that when eye complications develop they do so insidiously and late in the infection.

Treatment consists of the mechanical removal by surgical means of the adult worms. Excision of the nodules and their contained worms under local anæsthesia is simple and effective. No known drug administered by conventional routes will destroy the adult worms, but the larvæ can be killed by certain antimony compounds, and also by Plasmochin and possibly by other organic preparations. Their destruction is not of permanent value, as they are rapidly replaced by fresh supplies of larvæ from the mature adult worms, which are unaffected by such drugs.

DISCUSSION

There seems to be little reasonable doubt that the man whose history is here recorded became infected between 1929 and 1931 when he was in the neighbourhood of the Katanga province of the Belgian Congo. The case is of particular interest, because it is one of those in which there were no nodules to assist in a diagnosis. The complete lack of symptoms and signs until eye trouble insidiously developed in 1934, after his return to Europe, fits into the clinical picture of filarial blinding. The fact that a course of neostjbosan arrested the progress of the eye trouble in the acute stage is readily explicable by the known action of such compounds on the microfilariæ. And the reduction in the number of eosinophils as a result of this medication, and their subsequent increase in number, show how ephemeral the treatment is, as well as its complete lack of effect on the all-important adult worms. At present the eye condition appears to be stationary, and for the last twelve months there has been no evidence of progress in the damage which the eyes have sustained. There is little indication, therefore, for the administration of drugs

to destroy the existing microfilariæ. If, however, further eye changes occur, it may be advisable to give antimony or plasmochin with the specific object of destroying those larvæ that are actually causing the damage. Failing the removal of the adult worms, the actual location of which is impossible in the absence of nodule formation, no radical measures can be taken to eradicate the infection. It is impossible to say for how long the possibility of further complications may continue, as it is known that in many cases these worms live for a considerable number of years.

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A MECHANICAL BLOOD-PIPETTE SHAKER

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THE blood count is an estimation unfortunately beset by a host of possible errors. Inefficient mixing of the diluted blood in the pipette is an important, if easily avoidable, example. Without perfect mixing, the sample transferred from the pipette to the counting chamber is not likely to be representative, nor the distribution of the cells in the chamber itself an even one. Counting pipettes, therefore, are always shaken for at least three minutes as a routine in this laboratory. The fact that this procedure is time-consuming and tedious when many counts have to be done led Dr. Janet Vaughan to suggest that this part of the routine should be taken over by a machine. Although various types of pipette-shakers were on the market, none of them appeared to satisfy our requirements, which were as follows:—

1. That six pipettes, if necessary, could be shaken at once.

2. That any one of these pipettes could be started or stopped without interfering with the movement of the others.

3. That the machine should be simple, cheap, and above all, quiet.

*Assisted by a grant from the Medical Research Council.

The second condition was necessary because several workers would want to use the shakers, and obviously this independent control of each pipette was the main difficulty in the design, particularly when taken in conjunction with the conditions, simplicity and cheapness. However, the problem was solved, and the machine made to my drawings, by the Progress Manufacturing Company of Camden Town; costing about £15 complete. It has been working daily for the last eight months without the least trouble, and with a remarkable saving of time. Since other laboratories might find it equally useful, I append two sketches, drawn to scale, from which the main features in its construction can readily be followed. Mechanically it is quite simple, the only difficulty in its production being springs of the appropriate tensions. The machine is almost silent, and the base is supported on rubber blocks so that no vibration is transmitted to the bench.

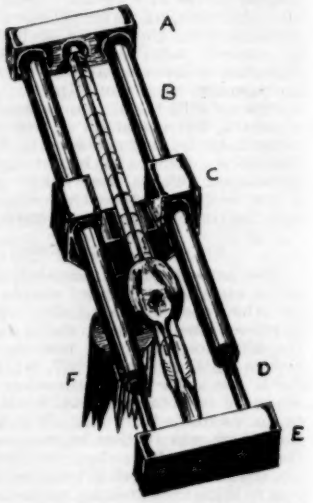

FIG. 2.—*A pipette-holder.* The end-plate E is mounted on the two rods (D) which are free to slide in the tubes (B) and are drawn inwards by spiral springs. Any length of pipette (within reason) may be clipped between A and E, engaging in rubber padded recesses. During shaking each holder travels over a 2 in. arc, changing direction 480 times a minute. The curvature of its path increases the efficiency of the mixing.

In order to test the efficiency of the apparatus as compared with shaking by hand the following experiment was made:—

Four hæmocytometer pipettes A, B, C, and D were filled from the same drop of normal blood. A, B, and C were shaken vigorously to and fro by hand for 1 min., 2 mins., and 3 mins. respectively. D was shaken for 3 mins. on the machine. Immediately after shaking a count was made from each pipette, using the same Bürker hæmocytometer. The whole process of shaking and counting was repeated until ten counts had been made from each pipette. Two drops of diluted blood were discarded from each pipette before each filling of the counting chamber. In each count the red cells in nine sections were counted. This area, in a count of 5,000,000 cells per c.mm., contains about 1140 cells. Since the sections are scattered over the whole ruled area of the counting chamber the individual totals will reveal uneven distribution of the cells, while the mean of the nine sectional totals

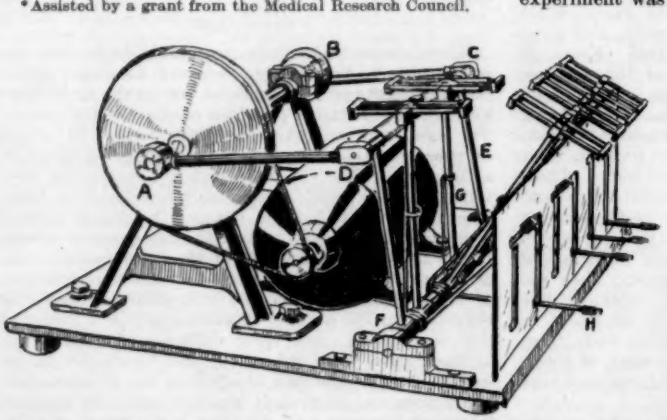

FIG. 1.—*The shaker.* The rod C–D is made to oscillate about the shaft F by the cranks A and B. The six pipette-holders pivot about the same axis. Any holder may be held in contact with C–D by a spring, thus receiving its oscillation. This motion may be started or stopped by the movement of a lever, the holder being stationary when the lever is in the lower position, as shown at H.

will be, to a certain extent, independent of this variation.

Some idea, therefore, can be obtained of the errors due to faulty sampling, which will be reflected in the mean counts, and of the errors due to uneven distribution, which will be shown by variations of the sectional totals in each count. Actually the former is the more important, since the routine erythrocyte count is arrived at from the mean of nine sections, in this laboratory, and as a further safeguard any count showing a variation of more than 10 cells between the sectional totals is discarded.

TABLE I—RED CELL COUNTS IN THOUSANDS PER C.MM. AFTER VARIOUS PERIODS OF SHAKING

Test.	Hand shaking.			Machine shaking.
	1 min.	2 mins.	3 mins.	3 mins.
1	5250	5180	5030	5080
2	5030	5020	5060	5170
3	5080	5080	4920	5010
4	4910	4920	4980	5040
5	4980	4840	4860	4850
6	4770	5100	5020	5260
7	5780	5000	5000	5200
8	5100	4930	4670	5040
9	4580	4440	4530	4880
10	4490	4740	4830	4890
Mean	4997	4925	4890	5042
Standard deviation	363	214	173	140
Coefficient of variation ..	7·28%	4·35%	3·54%	2·78%

The ten counts in each of the four groups are shown in Table I. In this the results are expressed as cells per c.mm. of blood, calculated from the nine sectional totals in each count. The standard deviation of each group is given, arrived at from the formula $\sqrt{\frac{\Sigma (x - \bar{x})^2}{n - 1}}$. These results show that shaking for 1 min. gives a much less reliable result than longer shaking, a difference that is technically significant. The progression of the standard deviations suggests that the most reliable counts are obtained after 3 mins. shaking on the machine, with 3 mins. by hand and 2 mins. by hand following in that order, though the differences are not technically significant.

TABLE II—VARIABILITY OF THE NINE SECTIONAL TOTALS IN EACH OF TEN COUNTS

—	Hand-shaking.			Machine shaking.
	1 min.	2 mins.	3 mins.	3 mins.
Mean of 90 sectional totals	125·27	123·44	122·21	126·00
Mean standard deviation within the ten counts	11·75	6·71	5·42	5·14
Mean variance within the ten counts ..	138·08	45·09	29·41	26·39

In order to get an idea of the possible differences in distribution of the red cells in each field, the standard deviation of the nine sectional totals in each count was calculated. The mean of the ten standard deviations in each of the four groups was then obtained, this mean standard deviation being an index of the section-total variability within the counts. The results of this analysis are given in Table II. Again the trend shows that shaking for 1 min. gives the least reliable results, and that greater reliability is obtained as the period of shaking increases. There is no material difference between shaking by machine or by hand in this respect.

The experiment appears to suggest, therefore, that shaking for 3 mins. is necessary if reasonably accurate results are to be obtained. If the pipette is shaken for 1 min. only the standard deviation from a mean of nearly 5,000,000 is 363,000 cells. Taking the limits of error to be $\pm 2\sigma$, the variation may thus be $\pm$726,000 cells. If 3 mins. shaking is given, however, the standard deviation is reduced to 140,000 cells on a count of 5,000,000, giving, on the same basis, a variation of $\pm$280,000 cells. In addition to this, efficient shaking gives a more even distribution of cells in the field. Shaking on the machine is, if anything, more efficient than shaking by hand and certainly less trouble.

The statistical analysis, which has been deliberately kept as simple as possible, was made with the help and advice of Mr. A. Bradford Hill, D.Sc., to whom my thanks are due. I also wish to thank Mr. H. R. Davis and Mr. A. J. Henington for their drawings.

TREATMENT OF INFECTED WOUNDS WITH UREA

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THE protein solvent properties of urea were first investigated by Spiro (1900), and independently by Ramsden (1902). We can find no further mention of this subject until Symmers and Kirk (1915) reported on its bactericidal properties together with its use in the treatment of wounds. In spite of this article the use of urea for wound therapy has apparently enjoyed little popularity in this country. In America, however, it has recently been used for the treatment of various infected wounds by Robinson (1936) and by Holder and McKay (1937), who found it extremely efficient. Moreover, it is a substance that is readily obtainable in quantity and is both cheap and stable. For these reasons it was thought desirable to test its efficacy in the casualty department of the Royal Free Hospital.

Since every wound covered with slough or debris is a potential breeding ground for bacteria, the removal of such tissue deprives the bacteria of a medium in which to grow and thus prevents reinfection of the wound. To enable urea to act in this way it must be used in concentrated solution. Consequently the fullest use is made of its protein solvent powers which are exerted on all classes of protein. It is possible that a concentrated solution has a bactericidal effect. Wilson (1907), in experiments in vitro, states that in urea solutions of 8–25 per cent. there is no growth of bacteria, while stronger solutions are bactericidal. No toxic effects have been

recorded even though the urea has been applied in solid form. We therefore decided to use both the saturated solution and crystals throughout.

TECHNIQUE

The procedure employed was as follows:—

The wounds were syringed free from pus and necrotic material with a saturated solution of urea, excessive moisture was removed, and the urea crystals were then liberally applied. Waxed paper was placed next to the crystals to keep them in contact with the wound and to prevent the dressings becoming soaked. This had the further advantage that it prevented the dressings from sticking to the raw wound surface. In all but very small wounds zinc cream was spread over the adjacent skin. This was used as a precaution, since some moisture will reach the surrounding skin however carefully discharging wounds are dressed.

INDICATIONS

For a period of six months cases of the following types have been treated: (1) Abscesses—superficial and deep lesions, both axillary and inguinal. (2) Infected traumatic wounds of all descriptions. (3) Infected hæmatomas. (4) Cellulitis. (5) Septic wounds due to burns of 2nd, 3rd, and 4th degree. (6) Varicose ulcers. (7) Carbuncles. (8) Infected tenosynovitis of the hand.

In all, 170 cases have been treated. Notes were kept on the progress of all of them, and in 70 of these detailed notes of the observations made were recorded. With a view to comparing the efficiency of urea with that of other solutions, the cases at first selected for treatment were those which had either behaved sluggishly with other antiseptics or had actually retrogressed. The results obtained were so favourable that we began to use urea more generally.

A patient presenting two infected hæmatomas on the outer aspect of the right leg gave us the opportunity of trying out the urea treatment side by side with a magnesium-sulphate, eusol and glycerin dressing (M.E.G.). Accordingly after the hæmatomas were incised, the larger of the two was dressed with urea and the smaller with M.E.G. After two days, whilst the larger wound showed a clean base with healthy edges, the smaller showed a sloughy base with turgid indurated edges. This difference was also observed by the patient. Both wounds were subsequently treated with urea until the patient's discharge, ten days later.

TYPICAL CASES

CASE 1.—A man aged 27 presented a varicose ulcer 1½ in. above the internal malleolus of the left leg. This ulcer measured 2½ by 1 in. He had had it for nearly 18 months without its having healed. During this time it had been treated with Elastoplast and various other substances. At the time the urea treatment was begun the ulcer was of oval irregular outline with everted swollen edges and a floor covered with a whitish foul-smelling slough. The adjacent skin was œdematous. The ulcer received the urea dressings daily for 14 days. After 2 days the foul odour had disappeared and after 4 days the base of the ulcer was covered by a mass of bright red granulations. By the 14th day the skin edges had grown in and the size of the ulcer was ¾ by ½ in. The floor was dry. The patient had a dry dressing and was discharged. The ulcer was again examined 10 days after the patient's discharge and was found to be completely healed.

CASE 2.—A male aged 47 had a septic area on the anterior and lateral aspects of the middle phalanx of the third right finger. This was drained but discharge of pus continued. The wound was opened again when it was found that the infection entered the tendon sheath. Adequate drainage was provided and the finger X rayed. There was no evidence of bony necrosis. The wound was then treated with eusol baths. After several days there was no attempt at healing. Urea treatment was started and after 3 days the slough was removed thus exposing the underlying tendon. Healthy granulations were present at this time (Fig. 1A). The urea treatment was continued, and the effects 18 days later are shown in Fig. 1B. The patient was discharged 22 days after the treatment was begun, the wound having healed completely. There was no loss of function.

CASE 3.—An Italian woman aged 44 presented herself with a 3rd degree burn of the left hand which had been neglected for 7 days. It extended from the anterior aspect of the wrist and spread across the palm laterally to the hypothenar eminence and distally to the base of the index-finger (Fig. 2A). The wound presented a large slough and emitted such a foul odour that other patients refused to be dressed in the same room and even dressers had considerable difficulty in suppressing nausea. The hand was soaked in a saturated solution of urea, then dried, and the urea crystals applied in the usual manner twice daily. She complained of some pain for the first 3 days of treatment. This was allayed by Luminal gr. ¼ b.d. Within 3 days the foul odour had completely disappeared and by the 5th day the slough had completely separated, and the wound showed a fairly good granulating area which was being covered by epithelium. By the 12th day the wound was reduced to nearly half its original size (Fig. 2B). At the time of writing, 5 weeks after urea treatment was begun, there remains only a small area unhealed (Fig. 2C).

CASE 4.—A youth aged 18 had a carbuncle at the back of the neck. This was opened with cruciate incisions and the flaps well undermined until healthy tissue was reached. The wound, which was 1 in. in diameter and ¼ in. deep was packed with urea crystals and dressed daily in the usual way. During the 3 days after opening, the wound discharged and he complained of some pain. The vascularity of the base of the wound was, however, very evident. At the end of one week the discharge ceased and the wound showed a healthy granulating base and was considerably shallower and smaller. Healing continued in this fashion, the skin around the carbuncle becoming progressively less indurated and less reddened. He was given a dry dressing and discharged 23 days after the first attendance.

DISCUSSION OF RESULTS

As will be seen from the above, we have used urea in a variety of casualty department cases. Owing to the extreme diffusibility of urea when combined with a saturated solution for syringing, even the deepest wound can be effectively treated. A very definite response to urea treatment is nearly always obtained after two or three applications, consisting in the disappearance of sloughs together with any foul odour that may have been present. Replacing the slough is a highly vascular granulating surface. However sluggish the local metabolism may be this response apparently may be relied upon and is indeed often spectacular.

Septic burns, even though they cover a very wide area, under this treatment become clean and form granulations so quickly that the surrounding epithelium is able to grow in with but little delay. The same prompt response is often obtained in *varicose ulcers*. Coupled with this is a considerable decrease of œdema as the local circulatory conditions improve. The time taken for complete healing of the ulcer depends on its size and depth and on its

chronicity. The response of *superficial abscesses* was good and requires no special comment. We gained the impression that the area of induration surrounding an abscess was in some cases eliminated and in all cases diminished by the urea. The treatment of *carbuncles* presented rather a different problem owing to the great variation in their depth, the most severe cases requiring in-patient treatment. For the carbuncles treated in the casualty department we found urea preferable to any other dressing after initial incision. Here, as with the more superficial wounds, urea could be relied upon to free the wound floor from necrotic material Where granulation tissue was more exuberant, there was sometimes bleeding during the treatment, but it was never persistent. Owing to the depth to which necrosis extends, it takes a considerable time to replace the lost tissue with granulation tissue whether urea or any other form of treatment is used.

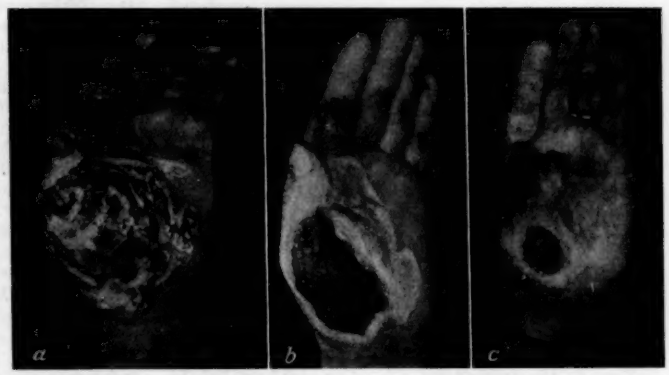

FIG. 2 (Case 3).—(A) Neglected seven-day-old burn of 3rd degree. (B) Twelve days later. (C) Five weeks after treatment began.

We have no evidence that urea directly stimulates epithelialisation. For this reason urea cannot be used as an "all purpose" casualty dressing. Many wounds will heal completely with no other treatment than the application of urea. Others though remaining healthy-looking do not heal completely. In those cases we stopped the treatment and applied one or other of the solutions in favour in the department as a stimulant to epithelialisation.

In none of the cases of our series did we observe any skin reaction which could be called a urea dermatitis, nor have we evidence of any toxic effects. We never saw a spread of sepsis under urea treatment

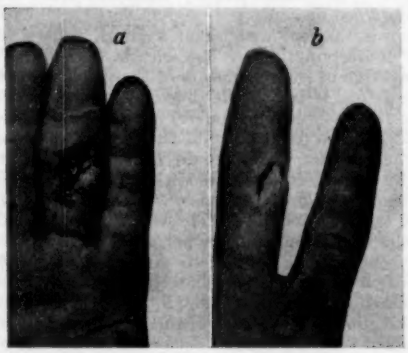

FIG. 1 (Case 2).—Septic wound with tendon-sheath infection. (A) Three days after urea treatment began and eight days after onset. (B) Eighteen days later; wound almost closed.

or any undermining of the wound edges. As a general rule no pain accompanied the treatment but in a few cases the patient experienced a burning sensation lasting half an hour after application for the first few days. It seemed to us that the pain was never greater than that in parallel cases dressed with other solutions.

It must be realised that urea does not exert an osmotic effect no matter how applied since cell membranes are freely permeable to it—i.e., any strength of aqueous urea solution will hæmolyse blood. Pain experienced as the result of urea application cannot be due to an osmotic effect.

CONCLUSION

The advantages of the urea treatment are as follows: (1) It is cheap, the crystals costing 1*s.* per lb. In the dry form it is absolutely stable. (2) It produces no dermatitis. (3) It deodorises foul-smelling wounds. (4) By dissolving necrotic material it produces a clean wound, so allowing healing to proceed. (5) Local circulatory conditions are improved and healthy granulations are produced. (6) It has no toxic effect and causes no necrosis of living material. For this reason unlike strong antiseptics it does not destroy the "leucocytic barrier" essential to the organism's defence. (7) Urea treatment has been successful where other treatments have failed. (8) We found no contra-indications to its use.

Its disadvantages are: (1) Pain is sometimes experienced on application. The cause of this is not clear. (2) Urea does not directly stimulate epithelialisation.

SUMMARY

(1) Urea has many properties that make it suitable for the treatment of infected lesions.

(2) Abscesses, carbuncles, whitlows, cellulitis, infected wounds, and burns have all been treated with success.

(3) The results of urea treatment on a series of 170 cases are discussed. They were so encouraging that the adoption of this method of treatment as a routine in the casualty department of the Royal Free Hospital is under consideration.

We wish to thank Mr. Cecil A. Joll for his helpful criticisms, and Sister North of the casualty department for her help with the treatment.

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ACUTE OSTEOMYELITIS OF THE PATELLA

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Acute hæmatogenous osteomyelitis is a common disease. The metaphyses of the long bones are the usual sites of election. It is uncommon for a short or flat bone to be affected. The patella is very rarely the seat of the disease.

CASE REPORT

A male aged 20 was admitted to the Royal Victoria Infirmary on Oct. 18th, 1936. On Oct. 7th he had fallen and knocked his left knee in the region of the patellar tendon. He experienced slight pain at the time, but this soon disappeared. There was no skin wound. Three days later the knee began to ache and swell. He was able to use the knee but this made the pain worse. On Oct. 13th he felt ill, redness appeared round the knee, and he had to take to his bed.

On admission.—Sallow-looking youth. Temperature 101° F. Pulse-rate 110. The left knee-joint was swollen and there was an effusion in it. There was some erythema round the sides of the joint. There was no swelling of the prepatellar bursa, and no point of tenderness round the knee. There was slight limitation of both active and passive movements of the joint. The patient experienced no pain when the heel was forcibly percussed with the knee extended. No other physical signs were elicited on complete examination. Aspiration of the joint was performed and 3 oz. of thick, yellow pus obtained. The leg was kept at rest on a Thomas splint. The temperature gradually subsided in the course of a week. Further aspiration was performed on Oct. 23rd, when 1 oz. of pus was obtained. A pure culture of the *Staphylococcus pyogenes aureus* was grown from the pus on each occasion. X ray examination of the joint on Oct. 26th showed definite rarefaction of the patella as the only abnormality.

Progress.—Weight bearing was allowed for the first time on Jan. 5th, 1937. When seen on Feb. 25th, 1937, all inflammatory signs had disappeared, but there was nearly complete ankylosis of the knee in very good position. Radiography showed the patella to be sclerosed and more defined, the lesion having healed.

CLINICAL FEATURES

Only 60 cases of acute osteomyelitis of the patella have been reported. Thirion published the first in 1829. In 1914 Chalaby was able to collect 20 reported cases and recorded one of his own. Chesky and Rocher in 1923 wrote extensively on the subject. The former reviewed the 34 cases he was able to find and added one of his own; the latter published an even more complete account, collecting 50 cases and adding his own. Neither review included the case reported by Rossenbach in 1922. The total number of cases is brought up to 60 by those reported by the following writers: Mariupolsky (1930) (2 cases), Manclark (1933), Christopher (1933), Sagel (1934), North (1934), Stella (1936), Rigaux and Milhiet (1935), and Martin and Horwitz (1935).

Ætiology.—A study of the reported cases has revealed certain facts about the disease. It has never occurred under the age of five and rarely after fifteen; 65 per cent. of the cases lie between these age limits. To account for this incidence Chesky quotes the work of Roepke (1904), who showed that up to the age of four the patella is a cartilaginous mass with practically no blood-supply. Vascularisation progresses with ossification. It is at its maximum at twelve and after this diminishes pari passu with age. The rarity of the disease is due to the patellar circulation. Roepke showed that small vessels pass from the plexus on the prepatellar ligament to the patella. The vessels are very small and soon break up into capillaries, the circulation through the bone being very sluggish. He regards the patellar circulation as a small shunt on the larger system of the limb. Infective emboli are, therefore, unlikely to be carried to this vascular side-track. In a large proportion of patients there is a history of recent trauma. The disease is five times more common in the male according to reports in which the sex is stated.

Pathology.—The usual causative organism is the *S. pyogenes aureus*. The pathological changes do not, of course, differ from those in other acutely inflamed bones. When suppuration develops it may involve the tissues round the knee, but more commonly the prepatellar bursa or the knee-joint is infected. The older the patient the more likely is the latter to occur. In the young the bony nucleus of the patella is separated from the joint by a thick layer of cartilage, which gets progressively thinner as ossification proceeds. In adults this layer is very thin and infection thus easily reaches the joint. Arthritis, however, is not a very common complication, although there is a sterile sympathetic effusion in practically every instance. In severe cases the whole or part of the patella may sequestrate.

Diagnosis.—The patient has all the general signs of an acute infection with localising signs about the knee-joint. There may be quite severe pain. The joint is held in extension unless an arthritis supervenes when the position of greatest ease of the joint (slight flexion) is assumed. In early cases radiography shows rarefaction of the patella; later a sequestrum may be seen. Diagnosis is difficult. Formerly it was made only after sequestra separated from the patella. Now radiography makes the task easier. The disease usually simulates acute arthritis of the knee or acute prepatellar bursitis. Often the latter is incised, and when a sinus refuses to heal the underlying bone disease is discovered. Our knowledge of the circulation of the patella is not very complete. It is possible, however, that the infection may in the beginning be very localised. The depth of this in the patella would then influence the course of the disease. If it should be very deep the joint might be affected early with little or no clinical evidence of patellar disease. Roepke's work showed that the infection was likely to affect the centre of the patella in children, and the periphery in adults.

Prognosis as regards life is very good. If arthritis does not supervene, complete function of the knee is regained. In many of the reported cases, in spite of this complication, a good functional result has been obtained.

Treatment.—An incision down to the patella should be made and drainage of the bone instituted. Several drill holes may be made into the patella, taking care not to open the joint, if it is not infected. When sequestra have formed, they should be removed. As long as the posterior cartilaginous part of the patella and the anterior fibro-periosteum are left, there is complete regeneration. When arthritis has supervened Johansson (1919) advises excision of the patella. This follows first principles in removing the focus of infection and provides for drainage of the joint. The recent work of Brooke (1937) seems to show patellectomy to be associated with improved rather than diminished function of the knee. If the condition could

be diagnosed before infection had spread beyond the patella, it would be the ideal treatment, as the disease would then be eradicated and the danger of arthritis removed. In all cases the knee should be rested on a splint, and when arthritis has occurred a light extension to separate the joint surfaces would appear advisable.

DISCUSSION

The case reported here bears out several of these facts but is anomalous in other respects. Trauma appeared to play a definite part. The patient was an adult and arthritis supervened early. Clinically there was very little evidence of patellar inflammation and the skiagram was a complete surprise. It is the type of case which illustrates the possibilities theorised above. It was not considered necessary to drain the patella and the absence of sequestration appears to support the wisdom of this course. Arthritis had already supervened but this subsided with aspiration only.

My thanks are due to Mr. F. C. Pybus, under whose care the patient was, for permission to make this report, and to Mr. A. Hedley Whyte for his help in obtaining the literature.

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MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON

AT a meeting of this society held on Monday last, Mr. J. E. H. ROBERTS, the president, took the chair and a discussion on the causes and treatment of

Flatulence

was opened by Prof. HENRY COHEN (Liverpool). A patient suffering from flatulence might, he said, complain of one or more of five symptoms: eructation, the passage of excessive flatus per rectum, distension, borborygmi, and pain or discomfort relieved by the passage of flatus or eructation. The pain was due to tension of the muscle-fibres of the alimentary tract. Flatulence might therefore be defined as gas in the stomach or bowels, giving rise to discomforts which were relieved when it was expelled. The sources of the gas were three: swallowed air; chemical (including bacteriological) change resulting in fermentation and putrefaction; and the direct excretion of gas into the tract from the blood stream. An important factor in the condition was the degree of absorption of gas, especially from the intestines.

Considerable quantities of air were swallowed normally, and radiograms of the stomach in the erect position often showed a *Magenblase* containing 40 or 50 c.cm. In general, little swallowed air passed into the gut. Gas was formed in the intestine in three principal ways. The first was the action of hydrochloric acid on carbonates in the food; the quantity of gas was small, and carbon dioxide in small amounts was not important. Secondly, carbon dioxide might be evolved from the carbonates of the alkaline pancreatic juices. The third and most important source was the fermentation and putrefaction of foodstuffs. Four factors tended to modify the absorption of gas from the intestine. These included the nature of the gas and its diffusion constant: carbon dioxide was absorbed rapidly, methane was absorbed much more slowly, and nitrogen was hardly absorbed at all. The gas tended to combine with hæmoglobin or one of the constituents of the blood plasma. The third factor in the absorption rate was the tension of certain gases in the tissues, which were already saturated with nitrogen to about the same degree as the outer air. Again, the condition of the mucous membrane was more important than had been generally realised. Changes due to toxins, inflammation, or vascular disturbances would affect the permeability of the cells, which was especially modified by the toxins of fevers and the irritative action of purgatives. The importance of fermentation had been much exaggerated, especially in the stomach, from which emptying was so rapid and where hydrochloric acid and oxygen inhibited bacterial growth. It might, however, take place if obstruction at the pyloric end caused marked stasis. Methane and hydrogen might then be belched in fairly large quantities, and this gas was inflammable. In achlorhydria bacterial growth was more rapid, even in the intestine. Under normal conditions in the small intestine the sterile chyme and its relatively rapid passage prevented much fermentation. This took place most readily in the ascending colon, the favourable factors being stagnation, fluidity of fæces, and the presence of large quantities of bacteria. Enormous volumes of gas could be evolved from relatively small quantities of carbohydrate: 100 g. of cellulose would generate 19½ litres of carbon dioxide, 7½ litres of methane, and 4 litres of hydrogen. Normally such gas was absorbed into the blood stream and secreted by the lungs. Any interference with the circulation of the bowel would therefore lead to an accumulation of gas.

Flatulence resulted only when the normal balance of activities was disturbed. If the symptom were to have significance, its underlying mechanisms in disease must be even more carefully studied and physicians must refrain from deluding themselves with such terms as flatulent dyspepsia. It had been customary to divide flatulence into gastric and intestinal. This distinction was largely artificial, and for clinical purposes it was better to classify according to the mechanisms of causation, more than one of which might be active. Prof. Cohen therefore suggested five types of flatulence: those due respectively to aerophagy, obstruction, excessive fermentation or putrefaction, disturbance of circulation, and damage to the mucosa. Aerophagy might be due to hurried meals at which fluids were taken, or to excessive salivation—as in parkinsonism and after operation. The commonest cause was perhaps, however, epigastric or substernal discomfort, the attempt to relieve which might set up a nervous habit. The discomfort might be an early manifestation of cancer of the stomach or gullet or of angina pectoris, or merely an expression of a nervous state.

Treatment should be based on very careful investigation of the cause. Less obvious causes were parœsophageal hernia, early angina pectoris, and early

hepatic cirrhosis. Organic causes must first be eliminated and diet corrected: meals should be taken slowly and with little fluid. Salivation should be checked with belladonna and the nervous system calmed with sedatives. Carminatives should not be given to the aerophagic, as they aggravated the condition. A neurosis should be treated by explanation, reassurance, and training rather than by psychoanalysis. The causes of obstruction were largely surgical—e.g., cicatricial stenosis, malignant disease, and diverticulitis of the ascending colon—and were not easy to show by X rays. Delay could be associated with spasm or atony, and the treatment of atonic constipation should include toning up the anterior abdominal wall by massage, or mechanical support. Atonicity associated with a post-operative condition might be benefited by such drugs as Prostigmin, pituitary extract, and acetylcholine. Flatulence due to fermentation was of two kinds: carbohydrate dyspepsia, marked by large quantities of odourless flatus, and attacks of mild diarrhœa with thin, yellowish, sour-smelling stool containing intact starch granules. For some of the cases roughage was responsible. The second group were chiefly associated with intestinal infection and excessive protein putrefaction. The patient passed the characteristic alkaline stool: putrid, containing undigested meat fibres and large quantities of Gram-positive organisms. The salivary glands might excrete considerable quantities of endoxyl derivatives, which stained the dentures dark. This action was sometimes evident after large quantities of purgatives. In intestinal carbohydrate dyspepsia, cereals and vegetables should be avoided, especially those which the patient recognised as a cause of flatulence. In protein fermentation a lactovegetarian diet should be substituted for proteins. Prof. Cohen doubted whether the administration of hydrochloric acid, taka-diastase, or any digestive enzyme had any value; intestinal antiseptics had none. Symptoms might be dealt with by carminatives, absorbents such as charcoal and kaolin, and the passage of a tube into the stomach or intestine.

Mr. C. W. GORDON BRYAN said that flatulence was very common in the large group of patients, many of whom were young, anæmic, asthenic women, who had right-sided pain, usually attributed to a chronic appendix. The anxiety associated with this diagnosis and perhaps with certain methods of contraception might be a contributory cause. There was a danger, however, of unduly stressing the functional element and overlooking organic causes such as partial obstruction of the colon causing pain in the distended cæcum. A large number of so-called "visceroptoses" could be relieved by freeing the colon from bands of adhesion, and the prominence of flatulence as a symptom rather indicated that a case was suitable for this operation. Cases must be carefully selected according to the local symptoms. Often the patients who derived most benefit were those whose colons were least descended. Rarer causes were displacement of the colon above the liver, displacement of a bulky and fibrous omentum above the stomach, and obstruction of the colon by perisplenitis. Carcinoma of the colon was sometimes the cause of unexplained flatulence, and in the pelvic colon might be impossible to diagnose without a sigmoidoscope. Duodenal stasis might be partly due to the drag of the superior mesenteric vessels over the third part of the duodenum, or to fibrosis about the lymphatic glands. Short-circuiting was not satisfactory. Early diverticulitis in the stage of pre-inflammatory spasm should raise the question of operation: either of excision or of short-circuiting. True paralytic ileus was very rare and in most post-operative cases there was an element of mechanical obstruction. In operating for pelvic appendicitis Mr. Bryan always delivered the last coil of the ileum after the appendix had been removed. It usually had a considerable amount of lymph on it and was often adherent to the lateral pelvic wall, causing a severe kink. If it were cleared off, the omentum were wrapped round it, and it were left well up in the iliac fossa, many cases of obstruction could be prevented. Some patients with acute appendicitis were distended from the beginning, and it seemed better to introduce a catheter into a coil of the intestine and drain the ileum as a prophylactic measure than rely on post-operative measures alone. Gastric cases with a considerable degree of obstruction were more liable to distension after operation, and the patient had to be starved. Jejunostomy enabled the surgeon to feed the patient from the beginning and rest the stomach, and after intestinal resection he could avoid the dangerous stage of distension before the union began to work. Mr. Bryan preferred gas-and-oxygen as the least toxic anæsthetic, and advocated intraperitoneal Novocain introduced through a catheter at the site of operation. A tight binder was responsible for much discomfort and distension after operation, which could be avoided by the use of special stays. Severe post-operative paralytic ileus should be treated by rest, and stimulants should be withheld. Continuous syphonage from the duodenum through the nose or mouth was valuable, as was the repeated administration of anti-gas gangrene serum—4000 units six-hourly for a few days—and the application of heat to the abdomen. If mechanical obstruction was not too severe, a spinal anæsthetic was often effective. Most valuable of all was the administration of vast quantities of fluid subcutaneously.

Sir ARTHUR HURST said that gall-bladder inflammation was one of the commonest organic causes of flatulence. The patient had an uncomfortable feeling in his epigastrium which he misinterpreted as distension; in his futile efforts to relieve himself he swallowed air. Ordinary cooking would not break the cellulose envelope of starch in vegetables. In the small intestine the starch-splitting enzymes passed through the envelope and dissolved the starch; the resulting dextrose passed out to the small intestine and was absorbed. When, however, the food passed too rapidly through the small intestine and undigested starch reached the colon, the colonic ferments dissolved it and the dextrose was fermented by the colonic bacteria. The most important treatment was to limit unbroken starch, as in root vegetables and rice. Diastatic ferments were of little use but charcoal was helpful. In the rare condition of *aërogastrie bloquée*, swallowed gas was imprisoned by a kink at the cardia which might be due to chronic obstruction—e.g., by a healed peptic ulcer; the patient might be relieved by learning how to pass a tube. Adhesions hardly ever accounted for the comparatively slight symptoms of chronic discomfort and flatulence, and most operations for their severance brought no benefit. In a large number of cases of diverticulitis he had only twice found it necessary to operate, preferring to rely on diet and an intestinal lubricant or mucilage.

Dr. A. H. DOUTHWAITE remarked on the frequency of distension and flatulence about the third day after operation for quiescent appendix or ovarian cyst. He suggested it was largely due to the post-operative treatment and had been much worse in the days of pre-operative purgatives and starvation. Patients

who had refused to take a fluid diet immediately after an abdominal operation had been comfortable and free from flatulence. The long starvation and lack of abdominal movement were responsible, and it was an unnecessary fetish to keep patients in bed for a clean incision in the abdominal wall. They were mostly quite fit to get up next day and even to walk about. Carminatives might act by producing a warm feeling, causing the patient to swallow more air until he brought up the whole accumulation. Dr. Douthwaite had never yet seen a patient benefit in any way from an operation for flatulence said to be due to colonic kink. No treatment was more liable to develop a confirmed hypochondriac.

Mr. V. ZACHARY COPE denied the importance of aerophagy. In the distension associated with volvulus the gas could not come from the stomach. Distension due to renal disease could not be explained by any of Prof. Cohen's five causes. He suggested that it might be a reflex phenomenon, as also might the distension associated with cholecystitis: a reflex atony of the large bowel. Suction by tube would, it was claimed, obviate the necessity for operation in a considerable proportion of cases. An American author had reported great relief, in flatulence due to obstruction, from confinement in an oxygen tent.

Dr. MAURICE SHAW declared that flatulence associated with gall-bladder disease was chiefly due to excessive postural tone of the muscular wall of the stomach, making the cavity too small for its contents. He agreed that this was probably a reflex effect. He could not agree on the virtue of charcoal.

Dr. T. JENNER HOSKIN said that in the treatment of heart disease the treatment of flatulence was almost the principal necessity. It was one of the greatest factors in acute heart failure, pulmonary œdema, cardiac asthma, and paroxysmal tachycardia. Strict diet was important: avoidance of fluids at meals and repletion. Bromide was valuable for nervous people, and an enema or high rectal tube was better than purgatives.

The PRESIDENT said that as a dresser he had been brought up to treat abdominal cases after operation with light, easily digested solid diet and a rectal tube. The patient who had trouble on the third day had usually been purged before operation and fed on slops after it. One cause of painful flatulence was spastic colon, which was almost instantly relieved by taking a lamella of atropine gr. 1/100 under the tongue. He had since always given atropine by this route.

Prof. COHEN replied.

MEDICO-LEGAL SOCIETY

AT a meeting of this society held at Manson House on Feb. 24th, with Judge W. G. EARENGEY, K.C., in the chair, a discussion on the status, scope, and legal position of

The Unqualified Practitioner

was opened by Dr. GERALD SLOT, who read a paper compiled by himself and Mr. B. A. LEVINSON. He distinguished three species of unqualified practitioners: the practitioner with real qualifications who had never been registered or whose name had been erased from the register; the person who did not possess the qualifications required by law for registration and who practised in a medically unconventional manner; and the egregious quack. Dr. Slot explained the legal distinction between registered and unregistered practitioners and the dangers of "covering." There was no legal objection to consultation between registered and unregistered practitioners. Although the law regarded all persons not on the register as in a single class, the courts would sometimes distinguish between one unregistered practitioner and another, or draw no distinction between a registered and an unregistered practitioner. Both were bound to use competent skill and care. In an action for damages the standard of skill and care was lower than in a criminal case. A jeweller, piercing a lady's ears for ear-rings, was not expected to exercise the same degree of skill or take the same precautions as a doctor. Similar standards applied to the optician. The duty of every unqualified practitioner was to refrain from treatment beyond his own limitations. One judge had remarked that the legislature had perhaps refrained from forbidding unqualified practice because, knowing the habits and customs of the English people, they were willing to leave a wide door open, particularly to those, such as rectors' wives and other "ladies bountiful," who delighted to practise the art of medicine without many injurious results. The habits and customs of the English included an aptitude to look upon medical treatment as a mystery and often to choose the mysterious to treat them. It was for their protection that restrictions were imposed.

The Medical Act, 1858, s.40, prescribed a fine up to £20 for any person who wilfully and falsely used the title physician, surgeon, doctor, or a number of others, or any title which implied that he was registered. The word "wilful" must be underlined. In Hunter *v.* Clare (1899 1 Q.B. 635) the court had decided, where a licentiate of the Society of Apothecaries had described himself as a physician, that the description was false but not wilful, inasmuch as he had reasonable grounds for thinking that he was a physician and did think so. Mr. Justice Humphreys, in Jutson *v.* Barrow,[1] said that it was not necessary to prove any intention of the accused to deceive or to represent himself as a qualified person. The wilfulness attached merely to the assumption of the description. An unqualified person could not evade the Act by adding a descriptive adjective to the word surgeon—e.g., manipulative or osteopathic. It seemed, said Dr. Slot, that if an unqualified practitioner were to carry on a medical practice entirely by means of qualified assistants without himself personally acting, and did not wilfully and falsely misdescribe himself, he would not be in breach of the Medical Acts. There was no clear decision in the legal reports of the question whether the use by an unregistered person of the name "Dr. So-and-so" was illegal. On the one hand a practitioner who announced himself in this way might be held to imply that he was legally qualified to practise. On the other hand, Murray's "Oxford Dictionary" said that the word "doctor" was, in popular use, applied to any medical practitioner. Apparently the use of this title did not come within the Acts. Another section provided that an unregistered practitioner could not charge for any medical or surgical advice or attendance, or for the performance of any operation, or for any medicine which he had both prescribed and supplied. Presumably he could not sue for the fees of a qualified assistant. If he had supplied the medicine but not prescribed it, he could probably sue; but if he had prescribed though not supplied it he had given advice. In Howarth *v.* Brearley (1887 19 Q.B. D. 302) the court held that a registered practitioner could not give a roving authority to an unqualified person to

[1] *Lancet*, 1935, 2, 1023, 1202.

practise in his name without consulting him or taking his advice, and then sue for the services rendered by the unqualified person. If a qualified man prescribed the treatment and an unqualified man carried it out under his direction, the employer could sue. The unregistered assistant could sue his employer for his salary, but not for services rendered by him to the employer's patients or for medicines supplied to them: De La Rosa *v.* Prieto (1864 11 C.B. N.S. 578). Thus, leaving room for irrational distinctions, the law penalised the unregistered practitioner while still recognising his calling as lawful. He could not hold an appointment in any public service or friendly society, give a statutory certificate, treat any person for venereal disease, or prescribe poisons; nor could he attend a confinement except under the supervision of a registered practitioner. Subject to these restrictions he was free to practise the art of healing in the usual way, and the history of medicine showed how dangerous it would be for the law to go farther than it did.

DISCUSSION

The CHAIRMAN remarked that the registered medical practitioner was at an unfair disadvantage compared to the quack in not being able to contribute to the lay press without risk of being charged before the General Medical Council. He suggested that it ought not to be difficult to get some lead from the G.M.C. upon what forms of medical articles were permissible and what were not. It was a pity that many medical men who could usefully serve the public in this capacity were prevented from doing so. The law was not inconsistent in allowing unqualified practice and at the same time not assisting the unqualified practitioner to recover fees. The legislature had not intended in 1858 to prevent anyone from giving medical or surgical advice. It had only been concerned to prevent unqualified persons from representing themselves as qualified. It might have felt that the doctors were not the sole repositories of medical wisdom, and that any unorthodox skill which had value should not be lost. The Act would not allow a doctor to sue for the fees of an unqualified assistant. The test of whether a doctor was responsible for the acts of a masseur was whether he could control them. Perhaps if the masseur treated the patient in a doctor's house the relationship of master and servant would be constituted, but if in another house it would not. In criminal proceedings for negligence against an unqualified practitioner the jury—whatever the law might be—would probably take the view that if the patient knew the accused was unqualified, he had accepted the risk. The doing by an unskilled person of an act which in the absence of skill carried great risk of injury, might itself amount to negligence. Thus if an unqualified practitioner tried to set a broken leg, that act in itself might be negligence for which an action would lie. If, however, he did a minor service that only required common sense, that need not be in itself a negligent act. The question was one of degree.

Mr. STEPHEN LANGDON suggested that the prohibition against suing for fees went back to an age when the enforcement of penal laws was largely left to citizens themselves. Perhaps Parliament had considered it impracticable to enforce a prohibition against unqualified practitioners and had taken this method of checking them.

Mr. E. R. BOLTON asked the position of the doctor whose name appeared with his qualifications in the directory.

Mr. D. H. KITCHIN said that the General Medical Council, in considering a charge of advertising by writing in the press, asked the question whether the doctor had sought by doing so to attract patients to himself for his own gain. He had received the impression that the Council were reluctant to answer questions relating to medical conduct addressed to them by practitioners. A masseur, exercising a special skill of his own beyond the doctor's powers, might perhaps be in law an independent contractor for whose negligence the doctor was not liable to pay damages.

Dr. G. C. ANDERSON protested that a doctor had the right, as a citizen, to instruct the public through the press about matters with which he was familiar, provided he did not thereby seem to attract patients. The G.M.C. would not give a ruling on such a question but would only pronounce judgment when a case came before them. They might sometimes be persuaded to issue a warning notice. Most masseurs had a self-denying ordinance, as a condition of their diploma, that they would only work under a medical man. A chiropodist did not so limit himself, but made his own diagnosis and treated patients independently.

Dr. FRED BULLOCK, referring to a decision of Mr. Justice Horridge allowing an action by an osteopath for fees on the ground that he had not been giving medical or surgical advice or treatment, objected that the practitioner must have advised the patient to undergo the treatment upon which he had determined.

Dr. W. G. BARNARD said that a doctor's name and opinion on a medical question might become news and be lifted by a daily paper out of one of the medical journals. This was a complicated and subtle form of advertising in which the doctor probably had no say.

Mr. NEVILLE LASKI, K.C., observed that all the decisions on Bar etiquette rested on criteria of good taste and common sense which he recommended to the medical profession. A large residuum of common sense was left to the jury which investigated the conduct of an unqualified practitioner. English law was wise in its dislike of definitions. All barristers and solicitors had come across extremely sad cases in which the law had left a loophole for the commission of monstrous acts by unqualified practitioners. He was strongly in favour of barring medical practice by the unqualified. Mr. Justice Horridge had awarded fees to an osteopath not for medical treatment but for work done and services rendered.

Mr. EDWARD HINCKS pointed out that a masseur usually worked on the patient's premises and so probably not under the control of a doctor.

Mr. LEVINSON, in reply, complained that doctors were not given nearly enough scope for educating the public on matters of health.

Dr. SLOT, also in reply, could not see any objection to the publication of a doctor's name and qualifications either in Churchill's or in any other reputable directory. Presumably a doctor who wrote in the lay press was dealing with the subject in which he practised, or he would not be entitled to write about it, and in that case it would be difficult for him to avoid the implication that he was attracting patients. The G.M.C. ought to lay down definitely who should and who should not sign articles.

BIRMINGHAM HOSPITALS CENTRE.—The Austin distributor and dealer organisation for Great Britain has given £7500 to the Birmingham Hospitals Centre to mark the golden wedding of Lord Austin. The money will be used to provide two wards at the centre.

REVIEWS AND NOTICES OF BOOKS

The Management of the Pneumonias

By JESSE G. M. BULLOWA, B.A., M.D., Clinical Professor of Medicine, New York University College of Medicine; Visiting Physician and Director, Littauer Pneumonia Research Fund, Harlem Hospital. London: Humphrey Milford, Oxford University Press. 1937. Pp. 508. 27*s*. 6*d*.

ANYONE who has had acute lobar pneumonia and has not had time to forget his feelings will probably retain as his most vivid impression the urgent desire to be left quietly alone. The experienced physician in attendance is aware of this desire and after one careful examination at his first visit in order to establish the diagnosis and determine the extent of the disease, he is likely to hand the patient over to the nurse and to interfere as little as possible with him. Those who have been brought up in this humane and conservative school will instantly cross swords with Dr. Bullowa over the statement in the early part of his book that "no patient is too ill to be examined." It would seem, moreover, that in his view no patient is ever too ill to be thoroughly investigated, almost daily, from the crown of his head to the soles of his feet.

Considered from the purely scientific viewpoint, his book is worthy of all praise. It is the outcome of studies carried on in the Littauer Pneumonia Research Laboratories at the Harlem Hospital, of which Dr. Bullowa is the director. During the six years that the work was in progress about 4000 cases of pneumonia, both adults and children, were admitted into the wards and were investigated by the author and his colleagues with a diligence which might be deemed ruthless but was certainly fruitful. No pains were spared to obtain the offending organism. This was achieved in numerous ways: by examination of the sputum, by pharyngeal swab, and even from the larynx by direct laryngoscopy. The two procedures, however, that yielded the best results were repeated blood cultures and lung suction. This last manœuvre, which sounds rather a terrifying one, has been performed by the author 2500 times; among all these cases there was only one sudden death, only four cases of non-fatal air embolism, while the incidence of empyema, in children at any rate, was no higher than that in cases not subjected to this method of investigation. From the wealth of material under study interesting facts emerge, such as the frequency of the various types of pneumococci in adults and children; the incidence of blood invasion with its influence on mortality; and the grave prognosis attending a mixed infection, particularly if both organisms are present in the blood. The general treatment and management of the pneumonia patient is considered at some length. Even those who are convinced that rest is the most important of therapeutic measures will find useful practical hints for the performance of simple procedures that will help the patient. Two chapters are devoted to oxygen therapy and oxygen tents and chambers. Dr. Bullowa condemns the artificial pneumothorax except to relieve pleural pain, but is a firm advocate of specific serum given early in bacteræmic cases and, if possible, before invasion of the blood has occurred.

The last section of the book deals with the specific pneumonias of adults and children, certain factors influencing prognosis, and closes with an account of the complications of pneumonia and their management. To each chapter is appended a full bibliography.

Practical Neuroanatomy

A Textbook and Guide for the Study of the Form and Structure of the Nervous System. By J. H. GLOBUS, B.S., M.D., Associate Professor of Neuroanatomy, New York University. London: Baillière, Tindall and Cox. 1937. Pp. 387. 27*s*.

THIS book consists of three parts of which the first is a guide to the practical study of the gross and microscopic anatomy of the central nervous system. Of the 25 sections each indicates the ground to be covered during a two-hour period of laboratory work. The figures are excellent; photomicrographs from Weigert-Pal preparations of transverse sections at all important levels are supplied, and beside each of these is a three-dimensional sketch of the cord or brain stem which is a diagrammatic key to the structures seen in the photomicrograph. This facilitates the correlation of gross anatomical features with microscopical findings and will help students who find it difficult to visualise the third dimension when looking at a section under the microscope.

The second part of the work bears the title "Résumés and discussions relative to the form, function and integration of the several divisions of the nervous system." It is designed to serve as a handy source of reference for those working through the practical course previously outlined, and will be useful also for purposes of revision. Fourteen case-histories are included, and the relation of clinical findings to anatomical facts is well brought out. The third part of the book consists of a series of outline figures of dissections and semi-completed drawings of microscopic preparations intended to be filled in and labelled by students during laboratory periods. These pages are perforated so that each may be removed temporarily while the labelling is done. The educational value of this section of the work is doubtful. Semi-completed drawings tend in our experience to irritate able students and to be ineffective in stimulating the observation of the less able.

Introduction to Physical Anthropology

Second edition. By E. P. STIBBE, F.R.C.S., Reader in Anatomy, University of London, King's College. London: Edward Arnold and Co. 1938. Pp. 230. 10*s*. 6*d*.

THE exaltation of certain physical types and the persecution of others, the deliberate preaching of racial prejudice and the enforcement of biased immigration laws have all been excused, justified, or eagerly vindicated by anthropologists. Hence it is necessary that those who speak in the name of anthropology should be men of wide education and culture, sincere in their scientific methods, and courageous without being dogmatic in their conclusions. The author of this book is a professional anatomist, has done distinguished work in tropical medicine, and has built up a reputation for himself in the field of experimental neurosurgery. He has moreover done much to promote the cultural and recreational activities of the medical students of the University of London. He has brought to this subject

what it most needs—a broad outlook coupled with severity of method.

Mr. Stibbe begins with a general biological introduction and then proceeds to make the student acquainted with the anatomy of the primates, their neurological make-up and their behaviour. This leads on logically to an account of man's evolution based especially upon the anatomy of both man and the great apes. The second part of the book supplies a general exposition of palæontology and, after a description of the various fossil primates, proceeds to the study of fossil man with a discussion on climates, ice ages, physical types, flint implements, and the like. The third part is concerned with the existing varieties of mankind and their physical assessment; and finally the reader is given detailed instruction in the technique of studying actual anthropological material living or dead, recent or fossil. The appendix by Dr. W. A. Smart includes a brief sketch of the mathematical methods by which large masses of anthropological data can be studied.

The administrator, the colonial official, the archæologist, the classical scholar on a "dig," the biologist, the student of evolution and genetics, the biometrician, the investigator of blood groups, all these and others may or must become students of, or give some measure of study to, physical anthropology. This easy, even gentle, introduction should encourage both amateur and professional readers to explore further one or more of the aspects of the study of man presented to him with such grace.

Ergebnisse und Fortschritte der Antimontherapie

By Prof. Dr. phil. nat. HANS SCHMIDT and Dr. med. F. M. PETER. Leipzig: Georg Thieme. 1937. Pp. 218. RM.15.50.

THIS book will appeal to two classes of readers, those practising tropical medicine and those interested in chemotherapy. The epoch of antimony therapy, which began about thirty years ago, has seen the discovery of the action of antimony in various tropical infections, and has provided a field for chemotherapeutic research in which, starting from tartar emetic, many less toxic and more convenient synthetic compounds have been developed. In 1922 one of the present authors, who has taken a leading part in the production of these drugs, published a book dealing with the developments of the first half of this period; principally, that is, with the therapeutic trials of tartar emetic. The last 15 years have witnessed the development of the modern pentavalent preparations, such as neostibosan and its precursors, stibenyl and stibosan, as well as of the newer trivalent compounds, especially fouadin and its prototype antimosan. The present book reviews this later period.

The opening chapter summarises the history of antimony therapy and briefly discusses the various types of preparation, their properties and mode of action and administration. This is followed by two chapters on their clinical application in human and veterinary infections. Then come chapters dealing with the synthesis, with the therapeutic laboratory trials, and with the pharmacological properties, as revealed both by experimental work and practical experience, of the various compounds. The final chapter records the newest preparations, including remarkable combinations of arsenic and antimony. The authors have sifted the voluminous literature and the bulk of the chapters consists of précis of the various papers in chronological order. This unusual form was chosen in order to give the reader a clear picture of progress and to reveal the sometimes divergent views; it facilitates reference to any article in which the reader may find himself specially interested. The various sections begin with brief sketches of the older therapy and end with short critical summaries.

A Monograph on Veins

By KENNETH J. FRANKLIN, D.M., M.R.C.P., Tutor and Lecturer in Physiology, Oriel College; Assistant Director, Nuffield Institute for Medical Research, Oxford. London: Baillière, Tindall and Cox. 1937. Pp. 410. 27s.

THIS book is principally a symposium of embryological, anatomical, and physiological literature on the venous system. It will be valued particularly by research workers and those interested in the history of medicine, for we know of no other work in English in which the venous system is described with such attention to detail. The field covered in the survey is wide, anatomical and developmental factors being ingeniously related to function. The experimental side is fully considered in its pharmacological as well as in the physical aspects, and in relation to certain special parts of the venous system as well as to the system as a whole. Dr. Franklin's own contributions to our knowledge of the mechanics of the venous circulation are rather obscured by the number of his references to the work of other investigators.

To clinicians the book has little to offer, except of course in so far as a knowledge of the normal venous circulation enables us to deal with abnormalities due to disease. But in a monograph of this size it is disappointing to find so little about the factors predisposing to phlebitis and the changes which occur even in healthy vessels as age advances. Thrombosis is scarcely considered, and nothing is said about the relative frequency of thrombosis in the veins of the arms and legs, and the factors which influence the incidence of this complication of intravenous infusions. The significance of the lymphatics which accompany veins and their involvement in certain cases of phlebitis is not discussed. This criticism is not intended to belittle the book, but merely to indicate its scope; for its object has been to set forth physiological principles, and in this it has been brilliantly successful.

The Therapeutic Problem in Bowel Obstructions

By OWEN H. WANGENSTEEN, B.A., M.D., Ph.D., Professor of Surgery, University of Minnesota; and Surgeon in Chief of the Minnesota Hospital. London: Baillière, Tindall and Cox. 1937. Pp. 360. 27s.

THIS essay, for which the Samual D. Gross prize was awarded to the author in 1935, is concerned with the therapeutic problem of intestinal obstruction. He surveys the literature and presents the results of experiments, particularly dealing with the effect of distension on the anatomy and physiology of the intestinal wall. The upshot of it all is to emphasise the importance of the vitality of the wall, and to show that toxic absorption is kept in abeyance so long as the mucosa remains alive. This section of the book is of much interest. The rest describes the clinical features of obstruction, its different forms and its treatment. It is a valuable contribution to surgical literature.

THE LANCET

LONDON: SATURDAY, MARCH 5, 1938

MATERNITY HOME ADMINISTRATION

RECENT cases in the coroner's court and elsewhere must be causing the public to wonder whether the patient who enters a maternity home for her confinement will get what she has a right to expect. An inevitable tendency to generalise may well create the impression that something is radically wrong with the system. While we have no particular instance in mind, we feel that the impression is not entirely ill-founded. Doctors seem to ignore the statutory regulations which require the notification of puerperal fever. Where several doctors are attending their patients in the same home, vital information about the condition of other patients seems not to be conveyed. Matrons seem to be so utterly dominated by the tradition of reliance on the medical practitioner as to be incapable of independent thought or action. The Ministry of Transport gives us a Highway Code to educate us in, and to insist upon, a high uniform standard of care upon the roads. The Ministry of Health ought to give us a Maternity Hospital Code which would bring to the uppermost level the widely varying standards of maternity practice. In one instance after another the expert witnesses have pointed out that the accepted modern precautions such as the use of masks, gloves, and sterilised clothing have been neglected or have been introduced only after some unfortunate fatality. Whose fault is it that, in these matters, something less than the best is tolerated? Is it ignorance or want of interest?

The hon. secretary to the British Hospitals Association, a body always alert to improve hospital conditions, has sent us some pertinent comments upon the situation. He points out that no practical steps appear to have been taken to avoid what BURKE called "dull uniformity in mischief and the unpitied calamity of being repeatedly caught in the same snare." He has taken the opinion of a barrister who has special knowledge of hospital matters. The barrister notes that there seems no person with medical knowledge in general charge of the maternity home whose duty it is to know the general condition of all the patients, to notify cases when necessary, to take proper precautions as to disinfection, to keep all the medical practitioners informed in emergency of the condition of each other's patients in the home, and so on. It seems to him that the remedy is that the lay governing committee in any home should appoint a superintendent—either a doctor or a matron—with the necessary medical knowledge and experience in maternity cases to know what steps ought to be taken in emergency and with the authority to enforce the doing of what is required. The superintendent, he continues, should be made to understand that he or she is solely responsible for seeing that the home is in a fit state for the reception of new cases, for closing the home when necessary, and for notifying to all doctors having patients under the same roof any suspicious symptoms in any patient.

The barrister confesses that he makes his suggestions without intimate acquaintance with the problems and anxieties of actual medical administration. A doctor may rejoin that, unless he is assured of an indemnity of the most solid financial kind, he will not volunteer for the position of superintendent wherein he will be the target of every action for damages for alleged negligence. Difficult as her post may be, it is the matron who has to bear the main responsibility. In the Ashby-de-la-Zouch case, it will be remembered, Mr. Justice SINGLETON explained that the matron could not absolve either herself or the hospital authorities by saying that she relied upon the doctor. She is, said the judge, the head of the hospital and is in charge on the administrative side. It is she who, subject to the hospital rules, makes the arrangements to receive the patients. She decides the bed or ward into which the patient shall go. She is held to know the conditions of the hospital and, in particular, of the maternity ward. It is her duty not to subject patients to the risk of infection. If she receives a patient into a ward where there is infection, she invites the patient into a dangerous place. It is, as Lord WRIGHT observed in Lindsey County Council *v.* Marshall, as bad as if the patient were invited to enter a hospital where the drains were defective and there was a risk of typhoid.

These dicta suggest that, without any change in the administrative structure, the matron is already charged with the very kind of responsibility which the proposed appointment of a special superintendent is designed to fix and define. Whether this be so or not, there must be many maternity homes which need to overhaul their organisation and their methods. The public must have been disquieted by Mr. Justice SINGLETON'S statement that, in the case already referred to, the mother would have been far safer in her own home.

THE ÆTIOLOGY OF APPENDICITIS

IT is five years since the pathology of appendicitis was considered at length in these columns,[1] and in conformity with the practices of modern governments it seems appropriate to review the advances that have been made within that period.

Acute appendicitis began to be common between 1895 and 1905; it serves no useful purpose here to discuss whether its incidence rose about that time or whether it merely became recognised as a clinical entity. On the assumption that it became commoner, changes in national habits have been sought to explain the difference; changes in diet (particularly the reduction of cellulose foods), the substitution of steel for stone millstones, and altered sanitary conditions have all been blamed. Consti-

[1] *Lancet*, 1933, **1**, 311.

pation has naturally been regarded with suspicion, but there is no statistical evidence to incriminate it; on the other hand it is agreed that acute appendicitis arises more often in organs that are bent or fixed than in those that are freely mobile. As to the importance of fæcoliths there is disagreement: ASCHOFF [2] regards their coexistence with appendicitis as purely fortuitous, but BOWEN,[3] SPENCER,[4] and many others hold that there is a definite ætiological relationship. With regard to the infective agent there are again two schools of thought—the hæmatogenous and enterogenous. ROSENOW put forward the view that acute appendicitis was the result of the selective affinity of certain throat streptococci for the appendix, whereas ASCHOFF,[2] by extensive studies of normal and inflamed human appendices, showed that the appendix has a special bacterial flora, the members of which are responsible for the attack; he suggested that in acute appendicitis there is an enhanced virulence of this normal flora brought about not by obstruction of the lumen but probably by stagnation of the fæces within it. FISCHER and KAISERLING [5] have attempted to explain ASCHOFF'S findings by the hypothesis that appendicitis is an allergic reaction and that a "specific sensibilisation of the lymphatic system" produces the altered relationship between the appendicular mucosa and its normal bacterial flora. HEINEMANN,[6] however, has shown that although an allergic appendicitis may be produced in rabbits, its lesions are distinct from those found in human appendicitis (the necrosis beginning in the lymphoid follicles rather than the mucous membrane); she believes that the intense inflammatory reaction obtained in FISCHER and KAISERLING'S experiments was chiefly due to the toluol used as a preservative and was not purely hyperergic.

The most significant experimental work of recent years is that of WELLS.[7] Working with rabbits he has shown that the injection of bacteria, damage to the mucous membrane, partial cutting-off of the blood-supply, or obstruction of the lumen by a foreign body have no effect on the appendix. If both the appendicular artery and the vessels in the meso-appendix are ligated the appendix becomes gangrenous; if in addition the lumen is occluded it merely shrinks. If, on the other hand, the lumen is occluded by a ligature without tying the vessels a mucocele develops. Finally if the lumen is occluded by ligature or by a foreign body, and the mucous membrane is damaged either by crushing the appendix or by inserting a needle and scratching the mucosa, fatal acute appendicitis always follows. From these experiments it is clear that in the rabbit acute appendicitis occurs whenever there is obstruction and a break in the mucosal barrier, the infecting organisms being those normally present in the organ; if the mucosa is intact obstruction merely produces a mucocele. These findings are in keeping with the hypotheses of BOWEN and SPENCER that in man acute appendicitis is an enterogenous infection associated with the mucosal trauma produced by a fæcolith. What the precipitating cause of an attack may be—whether purely mechanical or associated with local vascular change leading to œdema and consequent complete obstruction—remains obscure. Similarly the factors involved in the formation of fæcoliths are no clearer than they were when S. G. SHATTOCK postulated a "neuromuscular fault." The fæcolith is simply a concretion of fæcal material analogous to a scybalum and is not formed around a foreign body; whether the appendicular stasis which permits its formation is due to lack of coördination in appendicular peristalsis or in the secretion of mucus and absorption of water in the appendix is uncertain. In the normal animal, as WELLS [7] and HARRIS, COX, and BLALOCK [8] have shown, it is difficult to occlude the lumen by foreign bodies because the musculature forces them into the cæcum.

WANGENSTEEN [9] and his co-workers have investigated the functions of the human organ in appendicostomy cases. Lead shot were inserted and as a rule were rapidly passed into the cæcum, occasionally causing colic; organisms from suppurative appendices had no effect when introduced into the stoma. They also observed that although there is no true sphincter at the appendiculo-cæcal junction, there is nevertheless a definite resistance to fluid outflow, the basal pressure in the appendix being 15–25 cm. of water, whereas it is only 3–4 cm. in the cæcum. They were able to collect about 1–2 c.cm. of secretion from the human appendix in a day and they state that of all the animals investigated the only one that showed secretion was the rabbit, in which it could be enhanced by the administration of croton oil by mouth or of hypertonic saline intravenously—to such an extent that a ligated appendix ruptured. However, this animal experimental work is not perhaps of such significance as appears at first sight, for in every case they inserted a cannula into the tip of the appendix, and they do not distinguish clearly between a mucocele and an acutely inflamed appendix, whereas WELLS'S criterion of acute appendicitis was that it should produce a generalised peritonitis with death of the animal. It is also regrettable that WANGENSTEEN misquotes from WELLS'S paper, misinterpreting his very clear report.

Reviewing these various investigations it seems probable that in most cases of acute appendicitis the infecting organisms are those normally present in the appendix; that obstruction by fæcoliths is a predisposing cause; and that the precipitating factor is a complete obstruction of the lumen with injury of the mucosa. The ætiology of the fæcolith and the factors inducing this obstruction remain undiscovered.

[2] Aschoff, L., Appendicitis, its Ætiology and Pathology, London, 1932.
[3] Bowen, W. H., Appendicitis: A Clinical Study, London, 1937.
[4] Spencer, A. M., *Brit. med. J.* Jan. 29th, 1938, p. 227.
[5] Fischer, E., and Kaiserling, H., *Virchows Arch.* 1936, **296**, 146.
[6] Heinemann, K., *Beitr. path. Anat.* 1937, **100**, 62.
[7] Wells, A. Q., *Brit. J. Surg.* 1937, **26**, 766.
[8] Harris, P. N., Cox, B., and Blalock, A., *Surg. Gynec. Obstet.* 1930, **50**, 572.
[9] Wangensteen, O. H., Buirge, R. E., Dennis, C., and Ritchie, W. P., *Ann. Surg.* 1937, **106**, 910.

EXPLOSIONS IN THE OPERATING THEATRE

THE studies by Mr. E. H. RAYNER, Sc.D., of the National Physical Laboratory, on the production of static electricity and on its ability to originate explosion have already been practically applied in many operating theatres where small chains trailing on the floor prevent risk of explosion from static electricity generated on the table or apparatus from which the chains depend.[1] This simple precaution is of course not applicable if the floor consists of insulating material such as rubber or cork carpet. On Feb. 24th Dr. RAYNER in a paper read before the Institute of Electrical Engineers elaborated his view[2] that the danger of explosion from this cause in association with anæsthetics is extremely small in a humid atmosphere —at least 65 per cent. of saturation. This fact, or rather its converse, must be kept in mind when air conditioning is applied to operating theatres, for then the preventive humidity is often abolished. Moreover the care taken to prevent steam from the sterilising room entering the theatre removes a chief source of moisture and gives rise to the paradox mentioned by Dr. C. F. HADFIELD in the discussion on Dr. RAYNER'S paper that in America the theatre atmosphere is being moistened to avoid explosion, while here we are tending more and more to deprive the atmosphere of what humidity it might possess.

In this country the more frequent cause of ignition or explosion of anæsthetic vapours is not a static spark but faulty electric apparatus. At the same meeting Prof. W. M. THORNTON spoke of various types of electrical ignition. Of these, ignition by hot wires, as in a cautery, and by small lamps overrun and therefore unduly heated, appears to offer the greatest danger. In any inflammable gaseous mixture there are of course clearly defined limits of the proportions of the gas to air or oxygen that are explosive as well as of the critical intensities of the source of ignition whatever that may be. The probability of ignition depends in fact not only on the intensity of the spark but on the rapidity of chemical combination in the mixture, which itself depends on the proportion of inflammable gas and whether the diluent is oxygen or air. The limits of inflammability are much wider when oxygen is used. Prof. THORNTON after many experiments found the lower limit for ether-air mixtures was 3·14 per cent. and the upper limit 9·5. It is plain that with open ether administration the anæsthetist often handles a mask conveying a mixture within those limits of inflammability, and the rigorous exclusion of such a method from any operation where a cautery or other form of heat is used is thoroughly justified on scientific as well as clinical grounds. With ether-oxygen mixtures the observed limits were 2·98 and 45·5 per cent.; outside these limits explosions do not occur. In practice it is usual to blow a mixture of about 20 parts ether vapour and 80 parts oxygen towards the patient's mouth, and there is then some admixture with air. One practical result of Prof. THORNTON'S work is the finding that the small inherent inductances in alternating-current circuits may make them ignite ether mixtures more readily than do non-inductive direct-current circuits. Dr. HADFIELD emphasised the extent to which explosive gases had in modern practice ousted the non-inflammable chloroform, and the unfortunate fact that in some operations where cyclopropane, a highly inflammable gas, was most desirable its use was prohibited because the operations had to be carried out with the aid of diathermy. Dr. LANGTON HEWER pointed to the diminution of explosive risks when the closed-circuit CO_2-absorption method of giving anæsthetics is used.

To enlist the interest of such a body as the Institution of Electrical Engineers in the practical problems of ensuring safety for the patient is a wise step. It is easy, however, to exclude an inflammable anæsthetic so as to eliminate risk of explosion, and at the same time to expose the patient to a greater one by ruling out the particular drug that would otherwise be chosen. That is the sort of caution which would defeat its object and it is up to the electrical engineer to see that the anæsthetist is not called upon to exercise it.

[1] See *Lancet*, 1937, **2**, 460.
[2] *Ibid*, 1936, **2**, 1408.

APATHY AND FEAR

THERE is little need for us to draw attention to the article on p. 589. Dr. Hancock, being in charge of a mental hospital in a somewhat exposed position between London and the coast, is preparing his staff and his patients against possible air-raids, and gives us the benefit of his experience and ingenuity. His paper will be valuable to other administrators with similar tasks in front of them and they will have to consider in what respects they should follow his example. The first question that arises is how far it is necessary and desirable to appeal to fear, either in the population as a whole or (especially perhaps) in the insane. Fear of foreigners helps to unify small groups as well as nations, and possibly collaboration in air-raid exercises will bring some mental patients into better relation with their fellows inside the walls and with their compatriots outside. The use of devils to cast out other devils is an increasingly popular politicotherapeutic procedure. On the other hand one cannot help thinking that if apathy about the air menace is permissible anywhere it might be allowed to continue as long as possible among those who are unfortunate enough to be sent into an asylum—we use this outmoded word advisedly. As for the larger problem, much of the present tension in Europe is due to success in making people afraid of air attack; the Germans, Poles, French, Russians, Italians, and inhabitants of most other European countries have one after another grown terrified—and have increased their air forces, and apparent aggressiveness, accordingly. It is of course impossible to organise national defence at all without increasing the separateness of the nations—a separateness already pathological. But in taking precautions it should always be borne in mind that we must do as little as possible to spread fear and hatred.

ANNOTATIONS

MEDICAL EXAMINATION FOR MOTORISTS

On the basis that a considerable proportion of road accidents are caused by physical or psychological unfitness, a correspondent [1] has lately advocated the physical examination of all applicants for a licence, and the psychological examination of every licence-holder who has had more than a certain ration of accidents during the currency of his licence. Prof. Parisot and Dr. Richard,[2] as our Paris correspondent reports on another page, have been putting a similar suggestion before the French Academy of Medicine. It appears that members of the medical profession in France have repeatedly urged that driving licences should be issued only to persons who have passed an adequate medical examination; but the legislature declines to be interested. The evidence in favour of the proposal includes a striking decrease in the accidents of a large corporation which instituted a medical test for its drivers ten years ago, and a rise during a year in which the rule was relaxed. Parisot and Richard give a list of countries, including Italy, Germany, Denmark, and Holland, which have adopted the rule. The kind of case on which they lay stress is chiefly the cardiovascular one; the driver has a high blood pressure and arterio-sclerosis and may be suddenly overtaken by unconsciousness or paralysis.

In this country there is little sign of a popular movement towards medical examination for licence-holders, and at present the law contents itself with requiring a declaration that the applicant does not suffer from any of a number of named conditions. These include epilepsy, attacks of fainting and giddiness, and most of the physical and mental handicaps which are most dangerous to a driver. An applicant for the renewal of a licence has to declare that his condition has not changed. Besides the ordinary driving licence, the driver of a public service vehicle —e.g., a bus or motor coach—has to obtain a licence from the traffic commissioners of his area (in London, from the police), and before this can be issued he must produce a medical certificate stating that he is free from the handicaps specified in the form of certificate. When he applies, at the end of three years, for the renewal of this licence, he must make a declaration that his physical condition has undergone no harmful change (presumably, if his mental condition has deteriorated, he need not say so !). There do not seem to be any statistics showing the proportion of road accidents due to ill health in drivers, and there is no positive evidence that it is considerable. The question of legal liability might perhaps arise if a driver knowingly drove under a handicap and caused injury because of it. The Court of Appeal recently heard a case [3] in which a woman claimed damages against the employers of a lorry-driver who died suddenly at the wheel from fatty degeneration of the heart, so that the lorry mounted the pavement and pinned her against a wall. She claimed that the firm had been negligent in allowing a driver in that condition to drive one of their vehicles, and that they should have had him medically examined. The medical evidence, however, showed that this condition may develop without producing any symptoms until some slight exertion causes death. The man had in fact appeared perfectly well and the employers had never had any reason to suspect that he had a bad heart. The probability was that, even if he had been medically examined, the examination would not have indicated that he was likely to collapse that day. An ingenious attempt to couple a latent defect in the man to the vehicle, so as to make it a "Rylands *v.* Fletcher object" [4] for which the employers would be absolutely liable without proof of negligence, also failed, and the accident was adjudged to be an act of God. We recollect that in an action brought not long ago against a driver who had fainted at the wheel, he was held not to have been negligent and therefore not responsible for the resulting injury. His illness was, of course, not due to any of the conditions which he was bound to declare in his form of application for a driving licence. Another driver whose car killed a number of persons because he had an epileptic fit was found guilty of manslaughter, because he knew that he was likely to be attacked at the wheel and was therefore culpably negligent in driving at all.

[1] Turner, H. M. S., *Lancet*, 1937, **2**, 881.
[2] Parisot, P., and Richard, G., *Bull. Acad. Méd., Paris*, 1938, **119**, 122.
[3] Ryan *v.* Youngs, 1938, **1** (All England Rep. 522).

IMMEDIATE EFFECTS OF INTRAVENOUS INFUSION

Much experimental work has been done to prove the value of intravenous infusions. The demonstration of changes in the blood volume as a result of the infusion has been the chief difficulty. Gilligan, Altschule, and Volk [5] have studied the effects of isotonic and slightly hypertonic solutions given intravenously to human subjects, some of whom had been operated on but none of whom showed signs of shock. After finding the normal initial blood volume by calculation or a dye method they estimated the blood volume changes in three different ways:

(1) Plasma volume changes were found from alterations in the plasma protein percentage, and the total blood volume change was found from this and the hæmatocrit reading. It is assumed that the total plasma protein in the circulation remains constant.

(2) Plasma-volume changes were found by the "Evans blue" dye method, the total blood volume being deduced as before.

(3) Total volume changes were calculated from hæmatocrit readings, assuming that the red cells in the circulation remained constant.

Quantities of 450–1000 c.cm. were given at different rates. In all cases the hæmatocrit reading and plasma-protein percentage were lower after the infusion and the blood volume was raised. It is to be noted that the blood volume was still considerably raised half an hour after injection, and "appreciable" though small elevations were found "up to about two hours after the end of the injection." High rates of injection were more effective than low, but increases of blood volume above 20 per cent. were difficult to maintain. An incidental finding of great interest was the absolute reduction of red cells noted while the blood volume was raised. It is clear that calculations based on the constancy of the plasma protein in circulation are accurate if done over a very short period on conditions that are not likely to interfere with the plasma protein. And it is equally clear that fallacies are introduced in attempting to calculate the blood volume from the red-cell volume, when, as happened in this work, there was a decrease of red cells during a period of raised blood volume. Over a

[4] Rylands *v.* Fletcher, 1868, L.R. 3 HL. 330.
[5] Gilligan, D. R., Altschule, M. D., and Volk, M. C., *J. clin. Invest.* January, 1938, p. 7.

longer period, when changes in the total protein of the plasma are likely to take place, the assumption that the red cells remain constant is more reasonable. The dye method is reliable in this series since none of the patients was shocked and there was therefore no tendency for the dye to leave the circulation with the plasma. It is probable that, in the study of shock, the constant red-cell method will yield more reliable results than the other two. The ideal for this purpose should be a combination of the carbon monoxide and the plasma dye method.

From the point of view of treatment the present work is not very helpful, for only a temporary dilution of the blood by the intravenous fluid has been demonstrated. A comparison with fluids administered by the mouth or rectum would have been of greater interest.

MALIGNANT TUMOURS OF THE NOSE

UP to the beginning of the present century it was held that malignant tumours derived from connective tissue were more frequently met with in the nose and accessory sinuses than were those of epithelial origin; this view is now known to be erroneous and probably arose from the difficulty of distinguishing granulomata from neoplasms. Squamous-cell carcinomata are the most common, and this is probably to be explained by metaplasia, for the lining of these cavities chiefly consists of columnar ciliated epithelium. Because patients usually seek advice when the disease is far advanced, it is often difficult or impossible to decide the region in which the tumour has its origin, but the majority begin in the antrum. The prognosis, though bad, is better than it was a few decades ago, due to earlier recognition, to improved operative technique, and to the effects of modern irradiation therapy. In a thesis[1] written for the doctorate of medicine in the University of Groningen, of which a summary in English is appended, H. C. Wykerd discusses the pathology, symptoms, diagnosis, and treatment of these tumours. He holds that the best results are obtained by electro-surgery followed by irradiation. Great importance is attached to radiography, not merely for diagnosis, but to determine the exact locality of a growth, its operability, and the best method of its removal. The histories are detailed of 35 cases admitted to the University Hospital of Groningen during the last 13 years; of these 25 were carcinoma and 10 sarcoma. The site of origin is said to be the antrum in 22, the nasal cavity proper in 6, the frontal sinus in 5, and the sphenoidal sinus and nasal septum in 1 case each; but these figures must be accepted with reserve in view of the difficulty, mentioned above, of determining the site of origin in advanced cases. An interesting case is recorded where carcinoma in the left antrum developed a year after the removal of a carcinoma of the right antrum; there was no local recurrence after the first operation, the nasal septum was intact, and there was no visible connexion between the two sites. Metastases occurred in 27 per cent. of these 35 cases. Treatment is dismissed rather too briefly; of the 35 cases, 5 had no treatment, 14 received irradiation only, and 16 were submitted to operation with or without post-operative irradiation. One patient has not been traced, seven are alive and well, one after 3 months, one after 18 months, and the remaining five for a period of 3½ to 11 years. Of the twenty-two who have died, one survived for 4 years and 10 months, one for 3 years and 6 months, and two for 2 years, one of whom died from cerebral hæmorrhage; eleven died within 1 year, and seven within 2 years. Tables are given which show the results obtained elsewhere by various authorities, but the methods of treatment employed are not described in detail.

[1] Maligne Tumoren van de Neus en Neusbijholten. By Hermanus Claassens Wykerd. Groningen: J. B. Wolters. 1937. Pp. 148.

COMPLEMENT-FIXATION TEST FOR GONORRHŒA

THE gonococcal complement-fixation test can scarcely be regarded as new, for it was first introduced in 1906; but its place in diagnosis is not yet clear and those most familiar with its application in our large venereal diseases centres believe that its value is generally underestimated. Many pathologists have obtained conflicting and unsatisfactory results that have led them to criticise or abandon the test; but many of these failures have perhaps been due to failure to master a difficult technique without special instruction in it. At a meeting of the Medical Society for the Study of Venereal Diseases on Feb. 25th Dr. Orpwood Price and Dr. T. E. Osmond referred to the "bad performance of a good technique" and the existence of a number of unreliable techniques. It seems that the would-be expert must not regard this test as a side issue, but must be prepared for constant practice with a large number of sera, using a good technique and a reliable antigen. The results obtained must be rigorously checked against the clinical findings.

The test is, of course, a measure not of infection but of antibody-formation in the blood-serum, and the results depend therefore on the quantity of toxins absorbed and on the response of the tissues to these toxins. In gonorrhœa the nature and extent of infection and of immunity response may vary very widely, and there will be corresponding variations in serological reactions in different patients and in different stages of the disease. As Dr. Price put it, "this test is no more than an accessory method of diagnosis to be interpreted by the clinician in the light of the clinical findings." A negative result does not exclude the presence of infection either in preliminary diagnosis or in investigations as to cure, but a positive one may be relied on in a very large proportion of cases, provided that gonococcal vaccine has not been used in treatment. "False positive" reactions—that is to say, positive results in patients without clinical or bacteriological signs of infection—are rare; in Dr. Osmond's experience their incidence is only 0·3–0·6 per cent. Syphilis does not give positive tests but severe infections with *Micrococcus catarrhalis* may very occasionally do so. On one point only was there an important difference of opinion between these authorities—on the interpretation of a "fixed positive" test in the apparently cured patient. Dr. Price believes that the immunity never persists after cure and that a fixed positive serum test therefore indicates a latent undiscovered focus of infection. On the other hand, Dr. Osmond knows of patients who have continued to give such a reaction for years without showing clinical signs of infection; some of them have married and produced healthy children and there has been nothing to suggest transference of infection to the partners in marriage. With this latter view Colonel L. W. Harrison agreed. He has kept numbers of such patients under observation for years and believes that they are not necessarily carriers of gonococci, though absence of infection should not be assumed without the most careful possible testing and observation. Other speakers concurred in this view. It is

clear, therefore, that on this important question there is still difference of opinion, but the weight of experience seems to be on Dr. Osmond's side. To the clinician who must from time to time make this difficult decision as to whether a patient has got rid of every gonococcus these expressions of opinion will bring comfort; but they will not free him from his duty to impose the most exacting conditions of testing and observation before rejecting a persistently positive complement-fixation test as evidence of residual infection.

MEDICAL STUDENTS COMMITTEE

MOST continental countries have organised bodies representative of medical student opinion, but there has hitherto been no such organisation here. An attempt is now being made, under the auspices of the National Union of Students, to remedy this state of affairs. At the annual conference of the Union last April it was proposed that a national medical committee should be set up, and in July delegates from fourteen medical societies met for the purpose. The committee then elected meets each term and aims at furthering the welfare of medical students in every way possible. It has gained much support from the provinces but less, so far, from the London medical schools. The service of the N.U.S. travel department has now been placed at its disposal, and it is in a position to organise medical tours to any foreign clinic at reasonable cost. This Easter (April 16th to 28th) there is to be a tour to Sweden with visits to clinics at Gothenburg, Stockholm, and Uppsala. The committee will also introduce suitable guides to students visiting teaching centres at home or abroad. A library of cinema films on medical subjects is being formed. From July 18th to 21st there is to be a second London meeting of delegates (and others who care to attend) at which there will be a discussion on the Training of the Doctor. The address of the N.U.S. Medical Students' Committee is 3, Endsleigh-street, London, W.C.1.

THE QUESTIONABLE RAY

UNDER the title "The Campaign against Rheumatism" the *National Insurance Gazette* for Jan. 27th publishes an interview with Mr. Frank Bailey, general secretary of the N.U.R. Approved Society, and this interview has been widely quoted. Our readers will hardly turn to Mr. Bailey for information on the success attending medical efforts in the treatment of rheumatism, but it is important that they should take note of the message that is being handed on to the rheumatic working man. Briefly the treatment advocated consists in applying a "Q-ray compress" to the affected parts, and Mr. Bailey stated for the reassurance of his hearers that "our bold innovation was only made after personal experience and the closest investigation, when it was found that the Q-ray compress was being used extensively in most of the leading hospitals of this country, and also in the homes of the wealthy classes, with marked success." Mr. Bailey's society, it appears, secured permission from the Ministry of Health to offer Q-ray treatment as an additional benefit under National Health Insurance, and arrangements have been made whereby members receive grants of £2 5*s*. to £3 15*s*. towards their purchase, or half the cost of hire. The price of the compresses ranges from £5 10*s*. to £21, and this naturally evokes curiosity about their contents. The name suggests a new kind of ray, but it is not a name employed by physicists, and in fact the rays are from radium. It is to this radium that the benefits of treatment are ascribed; for we are told that though some of the compresses are heated electrically the heat "merely brings the blood to the surface, when the great energising and penetrating powers of the rays from the mild radium ore enter the affected parts." The radium content is certainly (and perhaps fortunately) "mild," varying from an amount equivalent in element to 0·013 mg. to a maximum of 0·1 mg. in different types of compresses. At current market prices the value of the radium would vary from one to eight shillings.

Mr. Bailey is reported as making the naïve remark that "the Q-ray compress must obviously be accepted by the medical profession by virtue of its having been tried out so extensively in the leading hospitals." No information however is given about the names of the hospitals or the results of the tests and we have failed to find any account of the merits or demerits of these compresses in the medical journals of this country. There appears indeed to be no prima-facie evidence for their efficacy. We are accustomed to think of the introduction of new remedies only after much toil, great patience, trustworthy observation, and critical insight. When these have been brought to fruition the medical profession is seldom slow to put them at the service of man.

SERUM PHOSPHATASE AND ASCORBIC ACID

IT has been known for some years that the activity of some of the animal phosphatases—particularly "phosphomonoesterase type A_1" [1] which appears in increased amounts in the blood plasma or serum in Paget's disease, in hyperparathyroidism, in rickets, and in certain other diseases affecting bone—may be enhanced by the addition of magnesium salts. The increase in activity, though appreciable, is usually not very great. A few other agents have been reported as having small effects, either adjuvant or inhibitory, on this enzyme. Recently Thannhauser [2] and his collaborators at the Boston City Hospital and the Tufts College medical school have announced (1) that ascorbic acid (vitamin C) is a very powerful activator of serum phosphatase and (2) that the large increase in the phosphatase activity of the serum that may be observed in certain diseases is not due to an actual increase in the amount of this enzyme in the circulating blood but rather to its activation. They do not say that this activation is caused by there being more ascorbic acid in the blood—indeed something of the order of a 5 per cent. solution would be necessary for the maximum activation of serum phosphatase—and they prefer to attribute it to a co-enzyme, of unknown nature, present in these conditions in the circulating blood. This possibility had not escaped earlier investigators, but since no positive evidence had ever been found in its favour it was assumed that the rise in enzymic activity is due to a genuine increase in the amount of phosphatase per unit volume of blood-serum, directly associated, in diseases affecting bone, with abnormal activity of, or possibly with damage to, the bone-forming cells, which more than a decade ago were shown to be a rich source of phosphatase. If Thannhauser and his colleagues are right in their two claims, particularly in the second of them, it will be necessary to revise present views of the connexion between phosphatase activity in bone and in blood plasma on the one hand

[1] Folley, S. J., and Kay, H. D., *Ergebn. Enzymforsch.* 1936, **5**, 159.
[2] Thannhauser et al., *J. biol. Chem.* 1937, **121**, 697; Maddock, S., Thannhauser, S. J., Reichel, M., and Grattan, J., *New Engl. J. Med.* Jan. 27th, 1938, p. 166.

and the growth and disease of bone on the other. The findings of King and Delory,[3] however, throw doubt on one at least of them; for careful experiment with several samples of ascorbic acid failed to substantiate the activating effect of vitamin C on serum phosphatase. If one of Thannhauser's claims is ill founded, the other becomes less secure.

TUBERCULOSIS SURVEYS

ELSEWHERE in this issue (p. 568) will be found summarised a preliminary report of a tuberculosis survey carried out by Dr. Noel D. Bardswell in Cyprus. The accumulation of such local tuberculosis surveys is by now bulky and covers a considerable period. Their administrative and human aspects have altered but little with the years; the advances made in the technique of diagnosis are reflected in the changes made in the methods of routine examinations. In the earlier surveys more prominence was given to the stethoscope than to X rays, whereas of late there has been a pronounced tendency to relegate the stethoscope to a place of second importance, and to exalt the virtues of screening and radiography with the help of portable X ray outfits. Dr. Bardswell apparently decided, doubtless for good reasons, to do his work without this modern and perhaps, to Cypriots, alarming apparatus. In the matter of tuberculin testing also certain swings of the pendulum are to be noted. The Pirquet test is with difficulty holding its own in the face of the disparaging comparisons made between it and the Mantoux test by Prof. Th. Madsen and his school in Denmark where the latter test is gaining ground. Both these tests labour under the disability of causing pain, however slight, and Dr. Bardswell has found it expedient to use Moro's quite painless test with the inunction of a tuberculin ointment. He admits, however, that the Mantoux test would have brought the Cyprus tuberculin observations more into line with similar surveys in other countries. It is impossible to read his report, full of shrewd observations on the foibles of his fellow-beings, without coming to the conclusion that, in such a delicate mission as his, tact and diplomacy are as essential to success as is a profound knowledge of the scientific aspects of the problem. His survey is, in fact, not only a study of the behaviour of tuberculosis in Cyprus, but also a determined attempt on the part of the West to understand the East.

VITAMIN A AND PREGNANCY

IN rats deficiency of vitamin A is known to favour difficult labour. Dr. W. H. Newton,[4] who has been pursuing this observation, finds that the proportion of difficult labours is far exceeded by the proportion of uncompleted pregnancies. His method was to put batches of rats on a diet deficient in vitamin A at different ages varying from 3 weeks (the time of weaning) to 65 days. One control group of rats was given a supplement of carotene daily; another group received a supplement of vitamin E, deficiency of which might otherwise have been held responsible for the incomplete pregnancies, but this addition made no appreciable difference. As a rule the rats became pregnant when about three months old. Among the 75 deficient animals, 12 showed no sign of pregnancy; in 8 the pregnancy was not completed, apparently because of reabsorption or abortion; and in 8 others pregnancy was incomplete for reasons undetermined. On the other hand there were no incomplete pregnancies or failures to conceive among the 21 animals receiving the carotene supplement. Judging by vaginal smears, which contained large numbers of cornified cells but no spermatozoa, Newton thinks that the failure to conceive was due to failure in copulation. The pregnant rats deficient in vitamin A had a higher proportion of dead fœtuses in their litters and the average weight of the fœtuses at birth was smaller. Twelve cases of difficult labour were observed; 3 of these rats were allowed to recover, 4 showed no apparent sepsis apart from possible secondary infection of the necrotic fœtal material in the uterus, but 5 exhibited definite infection of the uterus or the surrounding tissues. The degree of vitamin-A deficiency produced in the rats made respiratory infection hard to control among them but no xerophthalmia was seen. How far comparable deficiency prevails amongst women and how far these effects in animals have any human counterpart is not known, but with so many obstetric disasters attributable to lack of vitamin A it seems reasonable—until the contrary is proved—to ensure that pregnant women receive a sufficiency of that vitamin.

[3] King, E. J., and Delory, G. E., *Chem. & Ind.* 1938, **57**, 85.
[4] *J. Physiol.* 1938, **92**, 32.

STANDARDS OF COMMERCIAL ADVERTISEMENT

THE Proprietary Association of Great Britain is honourably striving to abolish by voluntary effort the unscrupulous advertisement of medical remedies and surgical appliances. Two years ago the House of Commons neglected the opportunity to set up uniform standards in these matters when it failed to give a second reading to Mr. Duckworth's Medicines and Surgical Appliances (Advertisement) Bill.[1] The rules now made by the Proprietary Association oblige its members to give an undertaking which in effect incorporates the standards of the Duckworth Bill. They undertake not to advertise or offer for sale to the public any medicine or treatment which is held out as being effective in regard to diseases like Bright's disease, cancer, tuberculosis, diabetes, epilepsy, lupus, or paralysis, or in regard to blindness, deafness, or sexual ailments, or any medicine for procuring the miscarriage of women. The Association's standard, indeed, is even higher than that of the Duckworth Bill; for, in certain cases where the Bill forbade the advertisement of remedies promising a cure, the Association's undertaking forbids advertisements which even commend a particular treatment. This attempt to control by private enterprise the deplorable abuses of advertisement, the exploitation of fear, and the dangerous and fraudulent preying upon gullible men and women is one which deserves recognition and support.

Old-fashioned theory deprecated the policy of trying to make people good by Act of Parliament. Moral suasion and ethical education were to be relied upon to reform abuses and improve standards. This kind of reform, however, is a plant of slow growth; meanwhile in the commercial world the pioneers who set the higher standard are out-distanced by less scrupulous competitors. The enforcement of a decent uniformity is difficult without statutory backing. When the Duckworth Bill failed in 1936, the accustomed arts of obstruction were employed. Opponents welcomed the principle while rejecting the opportunity. Reform? Yes, of course, but never this particular reform. One of the severest tests of Parliament as a legislative body is its treatment of non-party measures on their own merits. The conflict of interests has strange results upon a private member's

[1] See *Lancet*, 1936, **1**, 787

Bill. The senior member for Oxford University has recorded the temporary setback to his ultimately successful Matrimonial Causes Bill through causes strangely remote. It stood on one occasion third in the list for discussion. The first measure in the list was one for correcting some mistake in the Road Traffic Act, the second was one which concerned the sale of ice-cream on Sundays. Opponents of the second proposal, to prevent its being even discussed, organised prolonged opposition to the first with which they would otherwise have had no quarrel. The result was naturally detrimental to the third. Mr. Herbert's ultimate success, however, shows what a private member can achieve. When may we hope for like success with a second edition of the Duckworth Bill?

THE PHYSIOLOGY OF EMOTIONS

SOME observations on the physiological reactions of patients in a sanatorium for nervous diseases when under the influence of emotion have been made by Dr. H. I. Schou.[1] After a conversation directed to topics of known capacity to arouse emotion, physiological determinations, controlled by previous and subsequent examinations, were made of the area of blushing, skin temperature, metabolic rate, invisible perspiration, gastric secretion, blood-sugar, and adrenaline content of the blood. Remarking that "when a neurologist daily speaks to nervous patients he may make a number of interesting observations of the blush of shame," Dr. Schou shows that in any one individual this has a uniformly localised starting-point and that it is accompanied by an increase in temperature of the skin which is, however, much more extensive and therefore separate from the blush. A fall in temperature with emotion is common in the feet and hands. This is not due to alterations in sweat secretion but must arise from arteriolar changes. These changes are accompanied by a lability of the invisible perspiration, which may increase by 100 per cent. or more. "In slight, mixed emotions" the metabolic rate may rise by 23 per cent.; presumably as a result of alteration of muscle tone or through involuntary movements. Emotion affects the stomach secretion, as shown by the difference in Ewald test-meals before and after arousing "slight, artificially engendered emotion." There is a distinct decrease in the free and total acid. The type of emotion concerned is not detailed, but it is noteworthy that these results are strikingly different from those of others, for example of E. Wittkower (1935) who showed that in some persons increased secretion was a regular accompaniment of suggested emotion. The degree of anxiety induced by the test-meal, quite apart from the intentionally aroused emotion, is likely to be important. Blood-sugar increase is a less regular phenomenon in these investigations; it often occurred some time after the arousal of emotion and was followed by hypoglycæmia. In drawing conclusions from results obtained by the adrenaline testing technique (Cannon and Hoskins's rabbit intestine method) Dr. Schou is rightly cautious and would prefer to await better methods. He points out that the effects of emotion on certain biochemical determinations is too often forgotten. The fact that even "slight, mixed emotions" give rise to widespread somatic changes in human beings suggests a hope that further investigation of such matters may lead to therapeutic results in manic-depressive psychosis.

The limitation of outlook in these experiments is on the psychological side, and there are no indications in them that unrecognised emotional tensions or attitudes may exist and affect function. For example, although Dr. Schou refers to blushing as the "blush of shame," notes its occurrence in women more than men, and describes its predominance at puberty and the menopause and with exposure of the body, he feels that anxiety "seems to be a far more dominating cause than actual shyness or feeling of shame." Blushing is for him the result of a sudden rise of metabolic rate, even although its rapid occurrence makes this difficult to believe. What we call emotion may itself be a phenomenon so complex as to require analysis before its physiological accompaniments can be usefully differentiated.

[1] Some Investigations into the Physiology of Emotions. By Dr. med. H. I. Schou, Hospital for Nervous and Mental Diseases, "Filadelfia," Dianalund, Denmark. Copenhagen: Levin and Munksgaard; London: Humphrey Milford, Oxford University Press. 1937. Pp. 111. 8s.

DIABETES AS A PUBLIC HEALTH PROBLEM

Is diabetes a *public* health problem? Dr. Charles F. Bolduan[1] thinks it is, and an important one. It is, of course, a matter of definition. Diabetes is not a public health problem in the sense that we know of any way in which action on the part of the community will diminish the individual's liability to diabetes, nor is the diabetic liable to communicate his disease to his neighbours or by virtue of his disease be a nuisance to them. Dr. Bolduan's argument is that because modern treatment can improve and prolong the lives of diabetics, it is for the public health authority to aim at getting the largest possible number of diabetics recognised and treated, and he goes on to outline the programme of the New York Diabetes Association, founded for this purpose in 1934. It stimulates the interest of clinics and hospitals in diabetics and encourages their coöperation; it develops facilities for the education of both doctors and the public in diabetes; it tries to get insulin provided for the poor, trains nurses in the special nursing of diabetes, and generally works for the improvement of the lot of the diabetic. Dr. Bolduan says it has been very successful. We can believe him, and the inference is that five years ago the New York diabetics were being inadequately treated. Yet that was ten years after the introduction of insulin. The medical profession did not apparently give the community the benefit of a new piece of knowledge within that time. The reasons were no doubt complex, such as the practising doctor's failure to recognise and master something new and valuable and to distinguish it from the new and spurious; the economic difficulties and the ignorance of patients; the haphazard organisation of medical services in the community; and the fact that to understand and administer this treatment efficiently required a good deal of preliminary study. But the fact that a special drive was needed in order to get the comparatively straightforward management of diabetics properly carried out suggests that in many other directions the community is not deriving all the benefit it might from its doctors. Such a state of affairs is not confined to one country. It could be exemplified in England in connexion with diabetes, rheumatism, anæmia, tuberculosis, and many other conditions, and the complex causes of it, as well as the means of improvement, call for a great deal of study and experiment. The whole of medicine is still very much of a problem in public health in the sense that medical knowledge is far from making its full contribution to the health of the public.

[1] *Amer. J. publ. Hlth*, 1938, **28**, 21.

SPECIAL ARTICLES

WATER-BORNE TYPHOID

BY DUNCAN FORBES, M.D., B.Sc. Edin., D.P.H.
MEDICAL OFFICER OF HEALTH FOR BRIGHTON

AT the present time when so much thought is being given to the purity of water as distributed to the consumer, and the steps which should be taken to prevent the spread of water-borne typhoid, I think it worth while to draw attention to some of the earlier water-borne outbreaks. These should give us some guidance in framing preventive measures for the future.

SOME OUTBREAKS IN ENGLAND

Caterham and Red Hill, 1879.—Population, 16,000; cases, 358; deaths, 21. The water-supply was infected by an adit worker suffering from ambulatory typhoid fever and uncontrollable diarrhœa.

Worthing, 1893.—Population, 17,200; cases, 1416; deaths, 188. Before the outbreak men were at work in an adit. Day workers complained of the nuisance caused by members of the night shift defæcating in the adit. A rush of water drove the workers from the adit and polluted water gained entrance to an adjacent well and so to the mains.

Maidstone, 1897.—Population, 34,000; cases, 1700. The gathering ground included arable land near the surface of which were pipes with open joints which conducted water to the springs. Immediately before the outbreak the ground in the neighbourhood of the springs was plentifully covered with human excreta. Colon bacilli were present in 1 ml.

Coventry, 1901.—Cases, 60. There was a shallow well near which a case of enteric fever was nursed, and the ground close by had been excavated just before the outbreak.

Beverley, 1904.—Population, 13,183. There were 400 cases of diarrhœa followed by 32 cases of typhoid fever. An outbreak had occurred in 1885 when the wells were polluted from an adjacent sewage farm. The chalk in the neighbourhood is highly fissured and whilst driving an adit the workmen encountered a strong stream of water heavily charged with surface sand and gravel. The specific pollution was attributed to sewage entering the chalk three-quarters of a mile from the well, but more probably was from a sewage plant or its effluent which discharged into an open agricultural drain some 600 yards from the well.

Lincoln, 1905.—Population, 54,000; cases, 1058; deaths, 125. House drains were found to discharge into the catchwater drain from which part of the supply was drawn. The water before distribution was passed through inefficient sand filters which were raked over from time to time to increase the rate of flow.

Royal Marine Depôt, Walmer, 1908.—Population, 1073; cases, 33. The outbreak was due to infection of water in the swimming bath which was filled by the incoming tide. The intake was within 500 yards from the outfall of two sewers which contained the undisinfected fæces of typhoid patients. The flow of the tide was from the sewers to the intake and the water whilst the bath was being filled resembled storm water.

Swanage, 1910.—Cases, 24. Infection was traced to water from a well near some leaky sewers. Colon bacilli were present in 2 ml. and streptococci in 10 ml. of the well water.

Stroud, 1912.—Population, 13,428; cases, 71; deaths, 9. Men at work in well at the time water was infected but none was found to give a positive Widal reaction or to have typhoid bacilli in the urine (no note is made as to the examination of the fæces). The water in the mains showed *B. coli* in 1 ml. The well was in highly fissured chalk. There were numerous cesspools and probably leaky sewers in the immediate vicinity.

Kenilworth, 1913.—Population, 5990; cases, 43. The sewer which received the drainage from a house in which a typhoid case was being nursed overflowed into a stream between Nov. 17th and 19th. Water from this stream entered an adit from which the water-supply was drawn. Two cases sickened on Nov. 22nd, and 25 cases between Dec. 5th and 12th.

Bedlington, 1918.—Cases, 141; deaths, 21. The contents of privy middens which were emptied on agricultural land and other fæcal matter polluted the river from which the supply was drawn. The water was passed through sand filters which a severe frost followed, by a sudden thaw, had rendered inefficient.

Bolton-on-Dearne and neighbouring villages, 1921.—Population, 20,000; cases, 397; deaths, 45. Two outbreaks. The first was due to polluted water from old mine workings. Coliform organisms were present in 0·1 ml. A second larger outbreak was due to pollution of the public pump well. Coliform organisms were present in 0·1 ml. and *B. enteritidis sporogenes* in 5 ml. The well was open to pollution from privy middens and from a quarry containing scattered fæces, both close to the well.

Buckie, 1931.—Cases, 34; deaths, 2. Typhoid carrier lived in a house which had a pail privy, the contents of which were emptied close to a stream. Considerably lower down in this stream lay a defective and leaking water-main which supplied the infected area. Another possible entry of infection was from under the spout of a well where pails from the above-mentioned house might have been swilled. From the grating below, the water was conducted into the Buckie main supply.

Denby Dale, 1932.—Population, 1400; cases, 75; deaths, 11. One of the springs was supplemented from a stream polluted by drains. The spring water must have been polluted for years but no outbreak occurred until a young woman came from Scarborough to a cottage draining into the stream. She was notified as a case of typhoid on Sept. 17th and was removed to hospital on Sept. 19th. Between Oct. 8th and 20th 50 more cases were notified.

Malton Urban Districts, 1932.—Population, 4500; cases, 270; deaths, 23. At the time of infection there was a case of typhoid in hospital, whose fæces entered the drain undisinfected. The drain was so fractured as to cause disconnexion and its contents discharged into a cavity in the oölite where it quickly disappeared. The underground flow was towards the Lady well 250 yards away from which the supply was pumped. The well water contained colon bacilli in 1 ml.

Bournemouth and Poole, 1936.—Cases, 518; deaths, 51. The infection was spread by milk, but the milk was probably infected by water from a stream which received the sewage of a house in which a carrier lived. Typhoid organisms were at times found in large numbers in this sewage. The sewage was discharged into the stream 85 yards from the cows' drinking-place and their teats may have been infected.

Croydon, 1937.—Population at risk between 36,000 and 40,000; deaths, 42.

	Cases	Primary	Secondary
In Croydon ..	311	295	16
Outside ..	31	28	3
Total ..	342	323	19

A well was infected at a time when men, one of whom was a carrier, were working in it and its water was being pumped unfiltered and unchlorinated direct into the supply.

Those responsible for the purity of water-supplies should study the admirable reports on these and other outbreaks by the medical officers of the Local Government Board and the Ministry of Health, and

should consider whether their supplies are exposed to similar risks; such a study is likely to be reassuring.

INDICATIONS FOR CHLORINATION

In normal times when no work is being done in the headings, the precautions taken must depend on the character of the soil, the direction of flow of underground water, the rate of the rise of level of underground water after rain, the depth of the cone of depression, and above all the proximity of cesspools or drains and the possibility of a quick flow of sewage from these to the well or its headings. The investigation of these points is the combined work of the water engineer and the medical officer of health, who should consult together and review the position from time to time.

Under such varying conditions it is impossible to say how often well water should be tested bacteriologically. To take extremes; if cesspools or drains discharge their contents into highly fissured chalk upstream or in the vicinity downstream, then the water should be continuously chlorinated. Under such circumstances we should not await polluted samples to warn us of danger. If on the contrary the chalk is compact and the rise of the level of water in the wells is very gradual, even after heavy rains and there are no cesspools or drains within a quarter of a mile, then monthly examinations of the well waters should suffice. Even if colon bacilli are found in 100 ml. there is no need for panic, but samples should then for a time be taken weekly and if the bacilli persist and appear in, say, 20 ml., the water should be chlorinated. The occasional presence of colon bacilli in 100 ml. need not cause any alarm, as practical experience does not suggest that this points to the spread of typhoid.

In 1910 I abandoned routine disinfection after scarlet fever and diphtheria in favour of a "spring clean" because I believed infection came direct from a carrier and not from attenuated scattered organisms. Applying the same principles to typhoid, whilst I dread infection from recently polluted water, I have no fear of gradual soakage from cesspools through compact chalk into underground water fifty feet or more under the surface and a quarter of a mile or more from a well, as even if pollution does occur the organisms are diffused and attenuated. I do not consider that under such circumstances the presence of colon bacilli in 100 ml. indicates a pollution which will give rise to infection.

I have no doubt that the pessimist will picture a typhoid carrier (an uncommon individual) specifically infecting a leaky cesspool which opens into a swallow hole in the compact chalk, and this in its turn draining direct into an underground stream which rapidly carries the sewage to an adit, the whole process being hastened by heavy rains. He will point to tests carried out about 1900 at Croydon when brine and known bacteria washed into a swallow hole or depression in the ground found their way into the Addington well, a distance of two miles, within 48 to 72 hours. But even so the optimist will say that it would be strange if monthly bacteriological examinations of the supply had not earlier shown definite signs of sewage pollution. I will remain an optimist until I am convinced by actual experience (I hope of others) that water-borne outbreaks do occur without monthly bacteriological examinations giving timely warning.

PRECAUTIONS WHEN HEADINGS ARE BEING DRIVEN

It is quite a different matter when men are at work in the headings. Then if the water is not pumped to waste it should be chlorinated sufficiently to kill the typhoid group of organisms in diluted emulsions of fæces. In addition carriers should be excluded as far as possible by blood tests and the examination on more than one occasion of the fæces and urine of each man before he starts work in the headings, though these measures give no guarantee that all carriers will be excluded.

Before descending the shaft the workers should use pail-closets placed on cement floors and the pails should be emptied at a safe distance. The men should put on gum boots just before descending the shaft. Provision should be made for urination at the bottom of the shaft, at intervals in the headings, and near the site of work. Urine should be collected and brought to the surface in pails with tightly fitting covers. No smoking should be allowed underground as this encourages spitting. The workers should be warned of the danger from fæces and urine and should individually sign a pledge not to defæcate in the headings; the temptation may be great when they are working half a mile or more from the shaft.

As to the future, medical officers of health should regard it as their duty to keep themselves informed as to the precautions actually taken to prevent pollution of the water-supply. They should insist on chlorination when men are at work in a well or its headings and when they have reason to fear that leakage from cesspools or drains can find its way quickly into the well, but otherwise only if monthly examinations show the persistent presence of colon bacilli in 100 ml. and their presence at times in 20 ml. or less.

In this paper I have been intentionally dogmatic in the hope that I may provoke informed criticism which will assist the medical officer of health to judge how best to insure the safety of the water-supply of his area.

My thanks are due to the following medical officers of health who supplied me with unpublished information: Dr. O. M. Holden of Croydon, Dr. A. Ledingham of Banff, Scotland, and Dr. R. L. Thornley of East Riding.

CYPRUS: A SURVEY OF TUBERCULOSIS AND MEANS OF CONTROL[1]

"The Cypriot is an oriental. Cyprus is a detached piece of Asia, not Europe."

THE island of Cyprus, with a total population of about 350,000, passed into the hands of Great Britain as recently as 1914, and was given the status and name of a colony in 1925. The British occupation followed centuries of neglect to which is to be attributed the backwardness of the island. In 1935 certain information with regard to the incidence of tuberculosis in Cyprus was placed before the National Association for the Prevention of Tuberculosis. Tuberculosis, it was said, was rife and increasing rapidly. The council of the Association considered the reports received and not only offered £100 towards the cost of the establishment of a tuberculosis dispensary, but decided, after consultation with the Governor of the island, Sir Richmond Palmer, to carry out an epidemiological survey. The council was fortunate in obtaining the services of Dr. Noel D. Bardswell, whose familiarity with the scientific and administrative aspects of tuberculosis was felt to be a

[1] Tuberculosis in Cyprus. An interim report on its incidence and means of control made under the auspices of the National Association for the Prevention of Tuberculosis (Tavistock House North, Tavistock-square, London, W.C.1). By Noel Dean Bardswell, M.V.O., M.D., F.R.C.P. 1938. Pp. 228.

guarantee of the success of the survey. Mrs. Nita Jays, a highly qualified nurse, with experience of the East and a speaking knowledge of Greek and other serviceable languages, was appointed as nurse commissioner to act, among other things, as interpreter.

The survey began early in November, 1936, and a preliminary account of its operations up to the beginning of June, 1937, has now been issued under the auspices of the National Association. In this relatively short time it has, of course, been impossible to make an exhaustive study, but an interim report was prepared in order to meet the immediate need of the Cyprus authorities for information likely to assist them in the planning of an antituberculosis scheme. It may at once be stated that the tuberculosis problem in Cyprus is, in Dr. Bardswell's opinion, by no means so menacing as was feared. He says reassuringly (p. 2) "the disease presents itself in much the same character, intensity and distribution as in similar countries, perhaps even in a less degree. This means that the problem is one of manageable proportions, and that the disease can be brought under effective control by those measures which have proved successful elsewhere."

Dr. Bardswell's first step in Cyprus was to visit the chief towns of the island in the company of Dr. E. A. Neff, director of medical services. The object of this brief tour of inspection was to ascertain whether the incidence of tuberculosis in the island was high in comparison with that of other parts of the world, and to obtain personal knowledge of the various factors concerned. It was learnt that five-sixths of the people were Greeks and that most of the remainder were Turks; that the standard of life was low, the staple food being bread and olives, that agriculture was most primitive, and that the supply of water was insufficient and irregular. Bovine tuberculosis was happily non-existent, but the consumption of milk was very small. The only existing sanatorium was maintained by the Government, and its 40 beds were always full, their occupants being usually patients in an advanced stage of the disease. What was, perhaps, worst of all was the panicky fear of infection. The abbot of a monastery, interviewed on the subject of a suitable site for a sanatorium, was noticed to give the widest possible berth during the interview to the tuberculosis officer and nurse. This attitude was responsible for much of the hardships suffered by patients, who were liable to be turned out of a village and left to die by the wayside for fear of the infections they might cause. For the same reason, the discovery and examination of contacts were liable to be much hampered. The modesty of the Greek women and the attitude towards women of the Turkish population were other factors militating against the work of a tuberculosis officer. The quotation from Dr. Bardswell's report, which heads this article, is a key to its content.

Little wonder that, in the face of all these difficulties, Dr. Bardswell was in some doubt as to the best lines on which to proceed. He was warned that a tuberculosis dispensary would prove to be by no means acceptable to the town in which it might be established. As he pursued his investigations, he found it difficult to reconcile much of the information obtained with his experiences in England. It became increasingly clear that if the greater part of what he had been told was correct, the difficulty of introducing any effective control and treatment would be overwhelming. So he set out to verify the statements made to him. And in the course of his tours of the island he learnt how vivid, erratic, and almost fantastically unreliable are the creations of a more or less oriental imagination. Dr. Bardswell's essay on truth or the want of it, illustrated by picturesque examples, would have delighted a Pontius Pilate. As the tours of inspection proceeded, the visits to the villages became less and less formal and, in consequence, more and more instructive thanks to the intimate contacts Dr. Bardswell succeeded in establishing with the inhabitants through the good offices of his interpreter nurse.

Though tuberculosis had been notifiable since 1930, Dr. Neff had come to the conclusion in 1935 that the notifications represented less than one-quarter of the new cases. The reasons for this were not far to seek. The standard of diagnosis of chest diseases was low, and the fear of offending patients by notifying them was great among the doctors. But by means of Moro's tuberculin test and his clinical examination of cases in various parts of the island, Dr. Bardswell came to the conclusion that the incidence of tuberculosis in the island is not remarkably high. It would seem that tuberculosis is somewhat more frequent in the Turkish than in the Greek population, to judge by tuberculin tests of children and other observations. The choice of Moro's tuberculin test in preference to the Pirquet and Mantoux tests hinged on the comparatively heroic character of the two latter. The prevailing low incidence of positive Moro reactions—i.e., an average of 6·5 per cent. in 8084 children in the villages and 8·2 per cent. in 1841 children in the six chief towns—was noteworthy. It suggests that the risk of infection in Cyprus is no greater than in similar communities elsewhere. Dr. Bardswell did not observe a dozen cases of definitely tuberculous glands, and the cases he saw of tuberculosis of the spine, hip, joints, and peritoneum were "certainly fewer in number than I would expect to find in a comparable survey in England." He goes on to say that he is unable to confirm or disprove the rumour that the incidence of the disease is slowly increasing, but he suspects that the present slow change in the cultural habits of the people under Western influence will promote rather than retard the spread of tuberculosis.

Although this report is only preliminary, Dr. Bardswell has some important recommendations to make. The appointment of a tuberculosis officer able to devote his whole time to tuberculosis work would in his view be of greater value than any other immediate measure. He suggests that this officer should be British, and should preferably possess the qualifications and experience required by public health authorities in England for a tuberculosis officer; he should also have at least a working knowledge of Greek and should not be permitted private practice. Another recommendation is the provision of a staff of visiting nurses or trained health visitors. A nursing training would be a distinct gain, as in all villages there is much that a capable nurse can do in the way of minor medical and surgical aid. The combining of general district nursing work with that of a tuberculosis dispensary nurse would, as Dr. Bardswell points out, have the advantage of not making the latter too conspicuous as a tuberculosis worker.

The report is beautifully illustrated by photos, charts, and maps, and if it lacks the helpful amenities of a table of contents at the beginning and an index at the end, it must be remembered that this report is only provisional. Dr. Bardswell's work has already been found so valuable that, with the concurrence of the Cyprus Government, the National Association for the Prevention of Tuberculosis has resolved to continue the mission for a second year.

PARIS

(FROM OUR OWN CORRESPONDENT)

MEDICAL EXAMINATIONS FOR MOTOR-DRIVERS

Now that the motor-car is responsible for more deaths than either the typhoid or the diphtheria bacillus, most civilised nations insist on a medical examination of the prospective driver and refuse him a licence if the report is unfavourable. Germany and the Scandinavian countries rank as civilised in this respect, in the company of Italy, Holland, and the Balkans. But what a Baltic or Balkan State considers essential, such backward countries as England and France are uncultured enough to treat as superfluous. At a recent meeting of the Academy of Medicine, its members were urged by Prof. Pierre Parisot and Dr. G. Richard to help to hasten this much-needed reform. According to the statistics they quoted the human factor is to blame in from 36 to 80 per cent. of all motor accidents. In 1936 there were 4073 deaths in France from motor accidents, and from 50,000 to 70,000 persons are injured every year by the same cause. The benefits to be obtained by eliminating the mechanical factors responsible for motor accidents would seem to be small considering that only some 5 per cent. of motor accidents can be traced to this source. Since the Parisian motor-bus company made a medical examination of its prospective drivers compulsory, there has been a progressive fall in the number of accidents per driver from 1·5 to 0·6 (for 1936). In 1923 there was one accident for every 105,200 travellers, whereas in 1936 the corresponding figure was 212,300. Several other figures were taken from this company's records to show the life-saving significance of medical examinations for prospective drivers. A quotation from a discussion in 1926 in the French Senate discloses that the Minister of Public Works at the time bolstered up his case for doing nothing by holding up England not as an awful warning but as an example to be followed! Prof. Parisot and Dr. Richard crossed their t's and dotted their i's with several case records which had this in common that high blood pressure or some other easily recognisable ailment was alone responsible for the accidents. The root of the trouble is of course this, that legislators as well as motor-drivers are apt to be arterio-sclerotic, mentally or physically.

GROWTH OF INSANITY IN THE SEINE AREA

At the end of 1926 the public authorities of the Seine area had to deal with 14,257 insane persons, only 8965 of whom were interned in the Department's own hospitals. Ten years later, at the end of 1936, more than 20,000 had to be dealt with, and for some 7000 of these the Department had to seek the hospitality of provincial institutions. As the claims of the provinces on behalf of their own insane are also growing yearly, the accommodation they can offer to outsiders is reduced, and there is a distressing disparity between the number of mental hospital beds and the number of candidates for them. But it is an ill wind, &c., and it is to be hoped that since out-patient ambulatory treatment has become a necessity for many mental patients it will be developed on the lines so successfully followed at the present time at the Parisian Henri-Rousselle Hospital where a brave effort is being made to establish mental prophylaxis on scientific lines. As for the underlying causes of the remarkable rise in the frequency of mental disease in the Seine area in the past decade, much has been made of the influx of mentally unstable foreigners and of the ravages of alcohol. But the latter has always been with us, and as for the foreigner, he has so often been made a scapegoat in other fields that he fails to carry conviction here.

DEATH OF DR. SABOURAUD

The announcement of the death of Dr. Raymond Sabouraud will surprise many who, having been familiar with his name and reputation as a dermatologist since their earliest youth, must have assumed that he had passed on long ago. Yet he is the same man whose work on ringworm and allied skin diseases has long been a classic. He was honorary director of the Laboratory of the Town of Paris at the Saint-Louis Hospital, and president of the French Association of Dermatologists. He was also no mean sculptor, and he was much in demand for the engraving of medals struck in honour of members of the medical profession.

ASSÉCUROSE

At a recent meeting of the Society of Medicine of Paris, Dr. Laignel-Lavastine gave the above name to a disease which, in his opinion, is the child of the national health insurance scheme. Assécurose (ad sine cura) is a psychic ailment due to the craving of a patient to be care-free in the enjoyment of sickness benefit, and assécurose is to health insurance what sinistrose is to insurance against occupational accidents. The clinical manifestations of this ailment require, according to Laignel-Lavastine, psychotherapy and professional re-adaptation. While the name is new, the disease surely existed long before the recent introduction of national health insurance into France.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

STUDENTS' THREATS

THE Students Representative Council have protested to the board of managers of the Edinburgh Royal Infirmary against the decision of the board to increase the permanent hospital ticket fee from 12 to 18 guineas. There was even some talk of a strike by the students, who rightly pointed out that the hospital depends to a considerable extent on the assistance provided by the "juniors" in certain departments. However, after further discussion the protest has been withdrawn for it was pointed out by the treasurer of the Infirmary that this increase of fee is the first one proposed during the last hundred years, during which period the facilities provided for students have grown enormously as also has the cost of maintaining the hospital. There is no doubt, of course, that the services rendered by the students to the hospital are of great value and the withdrawal of this assistance would be a serious embarrassment to the staff.

COÖRDINATION OF HOSPITAL SERVICES

Addressing the annual meeting of contributors to the Royal Infirmary of Glasgow Sir James Macfarlane, chairman of the managers, made a vigorous plea for the coördination of hospital services. He said that those interested in such services still awaited the Government's decision on the recommendation put forward by the Cathcart Committee. The increased demands on the Royal Infirmary were

not only straining its financial resources to the utmost but they were calling for unreasonable services from doctors and nurses.

The difficulties to which Sir James referred are having close attention from the managers of all big voluntary hospitals in Scotland, for they are all faced with an increased demand on their services and hence with an increased financial strain. The difficulty experienced in obtaining enough applicants for the nursing profession, combined with the efforts to shorten the nurses' hours of duty, add considerably to these trials.

PAYMENT BY PATIENTS

Glasgow continues to take the lead in attempting to obtain payment from hospital patients—not, however, without some opposition as became evident at the annual meeting of subscribers of the Victoria Infirmary, Glasgow, last week, when the nomination of the honorary treasurer for a seat on the board of management was defeated by a candidate who was nominated from the body of the room. The meeting was evidently a very crowded one and the allegation was made that the treasurer's defeat was due to a "packed" vote. During the meeting a workers' representative pointed out that £14,000 had been provided during the year by workers' organisations; he objected to anything in the nature of a means test and maintained that anyone who was eligible for National Health Insurance should be eligible for the Victoria Infirmary without such a test.

DEADLOCK AT DUNDEE

The trouble about the proposed alterations in the chair of midwifery in Dundee, to which I referred on Feb. 12th, has not been lessened by a conference held last week between representatives of the Dundee corporation, Dundee Royal Infirmary, and the university court of St. Andrews. The difficulty has apparently arisen out of the failure of the University and the directors of the Infirmary to agree about an appointment to the hitherto associated posts of professor of midwifery and visiting obstetrician and gynæcologist at the Infirmary. Lord McGregor Mitchell, rector of the University, said that from the point of view of the students it could not be denied that in the Dundee Royal Infirmary they had an up-to-date and well-equipped institution most suitable for teaching and that they had as lecturer a lady whose skill and wide knowledge were unequalled north of the Forth. The chairman of the directors of the Infirmary stated that the directors are not opposed to the establishment of the Maryfield unit; but the transference of the chair of midwifery to the maternity hospital at Maryfield, with consequent development of its maternity department, could be achieved only at the expense of the existing services provided by the Infirmary. The directors suggest that there is no room in Dundee for two departments of midwifery and that any expansion should take place at the Infirmary where there is plenty of room for further building and where the running costs would be much lower. The proposed move would discourage subscription to their funds.

There is always doubt as to what part a university should play in the appointment of staff to the teaching hospitals associated with it and the unfortunate conflict in Dundee has brought to light a situation which might well develop in any of the Scottish medical schools; for the attitude of a university and of those who conduct the associated teaching hospitals are by no means always identical.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

PREMATURE USE OF RABBIT SERUM

In a letter written to you last summer I described the experiments being made with antipneumococcal rabbit serum. These experiments are still progressing hopefully, but premature publicity has brought the danger that a promising method may be discredited by too early adoption. To guard against this Dr. Edward S. Godfrey, Jr., health commissioner of the State of New York, has issued a statement deprecating any idea that the use of this new method of serum production will result shortly in the availability of serums highly effective in the treatment of all of the thirty different types of pneumococcus pneumonia. He finds it particularly unfortunate that the hope should be raised that a specific serum cure has been found for the prevalent and extremely serious type of pneumonia known as type III. There is as yet no conclusive evidence that this is so. At the same time the commissioner has made public a resolution adopted by his pneumonia advisory committee which bears on the question. The committee believe that the generalised use of antipneumococcus rabbit serum would be premature though in bacteræmic patients severely sensitive to horse serum or for whom no horse serum is available, its use might be justified. Otherwise, however, they feel that application of this serum should be limited to clinical trial in a few selected hospitals until the value, safety, and limitations of the method are more accurately defined.

This cautious attitude gets support from a report (published in the *New York State Journal of Medicine* of Feb. 15th, p. 245) from the Hospital of the Rockefeller Institute for Medical Research on the treatment of 67 cases of lobar pneumonia distributed among nine different types. In 13 cases of type III no evidence of the therapeutic effectiveness of type III antipneumococcus rabbit serum was demonstrated. The mortality-rate for the remaining cases treated with antipneumococcus rabbit serum of the homologous type was 3·7 per cent.

VITAL STATISTICS FOR 1937

The earlier reports of vital statistics for the last calendar year are arriving. The Metropolitan Insurance Company, always among the first to render an account, describes 1937 as "a star health year." Eight causes of death—typhoid fever, scarlet fever, tuberculosis, chronic nephritis, diseases arising out of pregnancy and childbirth, homicides, accidental burns, and railroad accidents—broke previous records for low mortality. The expectation of life at birth reached a new maximum of 60·7 years. The drop in pneumonia mortality despite an increase of deaths from influenza is significant. The alcoholism death-rate is the lowest since 1921.

HEALTH OF NEW YORK STATE

Dr. De Porte finds the health record of New York State for 1937 "outstandingly favourable" and notes with especial satisfaction the levelling off or reversal of trends which in recent years have given rise to serious public concern. For the first time in ten years there has been an increase in the number of births. The infant mortality-rate (45) was lower than ever before; the maternal mortality-rate (38 deaths per 10,000 total births) represents a reduction

of more than 20 per cent. from that of the preceding year, which was in its turn the lowest on record.

The death-rates from three of the important diseases of childhood—measles (0·4 per 100,000 population), scarlet fever (0·7), and diarrhœa and enteritis under 2 years (5·7)—were the lowest ever recorded, and the rates from diphtheria (0·6) and whooping-cough (1·3) were practically equal to the minimums of 1936. The sustained decline in the mortality from diphtheria is held to be a direct result of the application of scientifically proved methods of prevention and cure. In 1908 more than twenty thousand cases of diphtheria were reported in this State; last year cases totalled only thirteen hundred. In 1908 there were 2468 deaths from diphtheria; last year only 80. No cases of the disease were recorded in 1937 in forty-two of the sixty-eight Upstate cities and villages with over 10,000 population, and deaths were recorded in only six of these urban communities: Buffalo (2), Binghamton, Endicott, Lackawanna, Syracuse, Yonkers (1 each). The total number of cases of reportable diseases, exclusive of syphilis and gonorrhœa, was considerably below the 1936 total, or the average for 1932–36. Compared with the preceding year there has been no increase in the combined number of deaths ascribed to diseases of the heart, blood-vessels, and kidneys. Although the upward movement of the cancer death-rate continued, the increase was, proportionately, the smallest in a decade. The rise in the tuberculosis death-rate in 1936 was only temporary, and the 1937 rate was the lowest in half a century. Finally, notwithstanding an increase in the mortality from diabetes, syphilis, and influenza, the total death-rate was, with one exception, the lowest in the history of the State Department of Health. A total of 640 cases of poliomyelitis were reported, more than three times the total for 1936 but considerably less than the annual average for the five-year period 1932–36.

AUTOMOBILE ACCIDENT STATISTICS

The 1937 report of New York State's Motor Vehicle Bureau is less cheerful. Since 1925 there have been well over a million automobile accidents in New York State, involving a death or personal injury, the number of deaths being 35,654. The motor vehicle accident experience for the year 1937 was one of the worst in the history of New York State. During this year there were 82,085 accidents in which 3065 persons were killed and 106,482 persons injured.

SYPHILIS AND THE TABOO

Estimates of the incidence of syphilis in the United States range from 2 to 10 per cent. of the population, and the surgeon-general, Dr. Parran, believes that if certification were accurate syphilis would be found to be the chief cause of death. The enormous black population is a reservoir of infection that has no exact equivalent in Europe, for in the large towns, it is said, the average young male negro has a positive Wassermann. During 1937 there were signs that the country was awakening to the magnitude of this problem and that there was an increasing demand for drastic steps to check the disease, especially among young adults, who are most liable to attack. In various universities undergraduate papers started campaigns for compulsory Wassermann tests for incoming students, but at the University of Minnesota, where 7000 students were tested, only 6 positive reactions were found, and it seems that syphilis is very rare among undergraduates generally. The Institute of Public Opinion carried out a number of surveys during the year to discover how far the public were prepared to go in stamping out this scourge. The surveys showed overwhelming majorities in favour of government bureaux to distribute information, government treatment clinics, and a law requiring a test for venereal disease for all persons seeking marriage licences. There were smaller, but definite, majorities in favour of clinic treatment being free, and the punishment of known syphilitics who ignore the treatment provided for them. So far the federal government have not found the 25 million dollars which the surgeon-general estimates is necessary to finance an adequate programme of education and treatment, and the response to invitations to have a Wassermann done has been so immense that existing facilities for treatment have been swamped. This is natural as the organisation of clinics takes time, and pending the introduction of a federal scheme clinics are being provided on many different lines by local health authorities.

Above the legend "No Longer Taboo" the *Literary Digest* of Jan. 1st publishes a photograph showing a large crowd of young men and women with banners bearing the slogans "Chicago will Stamp out Syphilis," and "Friday the 13th is Unlucky for Syphilis." "The first step in the war against syphilis," says the caption, "was to bring the fight into the open. Over 1000 Chicago boys and girls helped in a city-wide campaign."

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE DUBLIN HOSPITALS

It is understood that the statement made in the public press a fortnight ago in reference to the future development of the Dublin hospitals, of which mention was made in my last letter, although unauthorised is substantially correct. The various hospitals are to submit their plans as soon as ready to the Minister for approval, taking as their basis the recommendations in the report of the Hospital Commission. In the meantime a committee of the hospitals concerned is engaged, in consultation with a senior officer of the Minister's staff, in working out a scheme for a central hospital bureau which will act as an admission bureau to the hospitals, and thereby get rid of the difficulties which, at present, often cause considerable embarrassment to both the patient who requires hospital treatment and his medical attendant. The decision of the Minister has given great satisfaction to the medical profession in Ireland, whose anxiety had been roused by a long period of suspense.

SIALOGRAPHY OF THE PAROTID

Sialography is the radiography of opaque substances injected into salivary glands. Writing in the *Quaderni di Radiologia* (1937, n.s. **2**, 139) on its use in the diagnosis of diseases of the parotid. A. Magnoni says that he uses 40 per cent. Iodopin for the purpose. As a contrast medium for salivary ducts this has the advantage over Lipiodol that it is much less viscid. He describes his particular technique in detail and illustrates his paper with sialograms from cases of epidemic parotitis, suppurative parotitis, parotid tumours, parotid lymphadenitis, chronic parotitis, and parotid calculus. In conditions such as a mixed parotid tumour or a parotid lymphadenitis, sialography is seldom of more than academic interest. Unfortunately Magnoni has not always been able to correlate the radiographic findings with accurate bacteriological and cytological information about the saliva, and this leaves some of the interpretations open to doubt.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM VRATCH

I

MANY years ago, before the Bolsheviks were even heard of in our part of Russia, I was driving at dusk through a village on my way back to hospital when a drunken peasant jumped on to the runners of the sledge and demanded that I should stop and treat his headache. He tried to drag me from the sledge by force, so I put my foot on the pit of his stomach and pushed him into a snowdrift. His manner and the strong language he used when he rose were such that a more exact diagnosis and a more medical treatment of his condition did not seem to be indicated. My driver, remarking that the fellow would have a worse head next morning, whipped up the horses and drove on. The trivial incident passed out of my mind.

One day, months later when the snow had gone, an unusual thing happened. A peasant in the waiting-room of the out-patients asked to be seen *last*, in contrast to the usual clamour to be seen first. When all the other comers had been attended to, the moujik, standing rather shyly by the door, said "Doctor, don't you recognise me?" I looked at him carefully and said I did not, then turning to the O.P. register, asked when he had been before and what his trouble was. He said he had never been before and had no ailment, but before proceeding he must know that I recognised him. I told him to come to the point, if he had not been before and was not ill what knowledge had I of him, and what did he want of me in the hospital now? "Doctor, if I tell you you won't be angry with me, will you?" I searched my mind for possible wrongs received, things stolen from the hospital or my house, swindlings at the fortnightly fair where I had bought sheep and pigs; but remembered nothing amiss that I could associate him with and gave him my word I would not be angry.

"Do you remember months ago in the village of —— a drunken man set upon you as you were driving through and demanded that you should stop." The scene came back in a flash. "And do you remember," I said smiling, "the doctor who put his foot in that man's belly and gave a shove! Damn it all, man; we were quits." "Now doctor, don't make a joke of it. It's a serious matter." I thought I must have injured him, so apologised and asked him to tell me all about it.

He then began a long story. He had been drunk and felt sick and thick in the head; so seeing me, he suddenly had the bright idea of demanding an instant cure. But his headache made him angry and he tried to do this by force. He had attacked me and that was wrong. Before he asked my forgiveness, it was necessary that I should know exactly who he was and recall the circumstances. He then very shyly produced a document which ran roughly as follows:—

This is to certify that I [here was a space for my name] have received the apology of—— ——, of the village of ——, on the [space for the date]. And this is also to certify that the elders of the said village of—— after careful examination are convinced that —— ——'s apologies are from the heart. [Date, signatures of village elders and crosses of attestation.]

The whole thing seemed fantastic; an apology was in the circumstances odd but understandable, but the certificate seemed all out of proportion. I made up my mind to see the village elders and try to clear the matter up.

A few days later my round lay through that village and I called on several of the elders. They said they had been horrified by the attack on me. I had done them no harm, on the contrary had been diligent for their good, and it was necessary to eradicate the evil disposition which had shown itself amongst them that night. I pointed out that my quite adequate physical defence had prevented injury to me being laid on the man's conscience, and also that I had attended patients in the village after the episode just as before, so they need not fear the loss of my assistance; but that was not the point. They felt the attack to be a stain on the honour of the village. They had reproached him next day and asked him to apologise. He was defiant in refusal (perhaps through the humiliation of having been rolled over in the snow) and finally brought forward in extenuation the obvious fact that he had been intoxicated. But this for them was no excuse; when sober one must make amends for one's deed when drunk. Then, since as a group they had not been able to persuade him to apologise, they changed their policy and approached him as individuals. They also got his friends to join in their efforts and for weeks the poor devil was followed wherever he went with reproachful eyes. One day he burst upon them with the news that he would go and apologise. But his manner of saying it did not satisfy them; it was hasty and still somewhat defiant; his heart had not changed. They accepted his consent to apologise as a good sign but not necessarily as an indication of true repentance. Gradually he became more passive and waited patiently to be "released" by the village elders from the yoke of guilt. He then came to me with their certificate.

This narration left several things unexplained. This repentant sinner had been brought once more within their most sensitive and intimate circle, had become again what the village calls "one of us"; after months of communion with him he had been found to be pure in heart. Why then did they need my signature to the certificate of release? Did it mean, I asked, that they could not after all trust him to apologise? They said that they did not distrust him, but that they wished me to know that they felt themselves also to be involved in the insult and hence also in the restoration of the honour of the village.

* * *

This was their explanation. There were of course other reasons for dealing with me in this way. A physician was an object valuable to them. They were helplessly dependent on him and his goodwill, and however familiar he might be as a visitor in their homes and at their councils, they *as a group* could not replace or reproduce him because he belonged to a different civilisation, the culture of the metropolis and of international communications. Towards all members of this culture they looked with abject submission, envy, and sometimes hatred; from this metropolitan civilisation came to them tax gatherers, *political* police (civil order was maintained, as this story shows, by the villagers themselves in a most

unbureaucratic way), landlords (for the most part absentee), priests, a few schoolteachers, and a very few doctors. These, one and all, belonged to the metropolis, not to the village. Over all loomed the distant and terrible, revered and incomprehensible figure of the Czar, who, however widely his characteristics ranged over everything Russian, certainly was not "one of us."

It was a sign of affection and trust in me that the village elders did not themselves come crawling to me with an apology, but a sign of latent fear that made them send the certificate. A not unfriendly representative of an alien world, I belonged to the culture of the town, distant from them though familiar with their village ways. The gulf between us narrowed when the relationship was personal, widened when it touched on the doctor's position in the social structure.

This little episode shows something of the way in which the villagers were bound together by ties of love and how they kept the spirit of their community intact. This spirit gave the members strength when they were in accord with it, and they lived in misery and isolation when they broke, in thought or mood, with the opinion and sentiment of their neighbours. The episode also shows how difficult it was for them to include a member of the alien caste in their way of thought and living.

* * *

Some of the social history of the next few years is well known. The Bolsheviks came to power and made all things new. The peasants were collectivised, many were forcibly moved to public works, many more were driven by starvation to seek a living in the towns. The new social unit became the factory, and the old village organisation ceased to be typical for the Russian people. But its spirit did not die.

* * *

Seventeen years passed, and an Intourist traveller brought back from one of the large new cities a collection of factory wall-newspapers (the placards on which anyone may freely criticise anyone and anything except the essentials of the New Régime). Most of the contents related to the factory, statistics, how the shock workers were breaking records, sport, factory-theatre and music news, and so forth. Down in a corner (always the same corner of each issue) there was a series of notes which at first glance seemed of the most trivial significance. But their spirit was reminiscent of the village I have mentioned, and heaven knows how many thousand like it. The notes ran somewhat as follows: "We do not like the way Sonia —— does her work. She doesn't show the right spirit; she slacks." Several times was she thus publicly reproved; later she was said to show signs of adopting the proper attitude. Finally Sonia was declared an enthusiastic worker who had entered truly into the spirit of the Revolution.

On reading this my mind went back to the peasant whose heart was changed by the silent but not harsh pressure of the group; the steps in this re-entry into the community seemed to be remarkably similar in the two cases; in spite of the greatest imaginable change in the economic and political life the behaviour of the group to a wayward member remained the same. The village spirit, the need to feel that everyone was "one of us," had re-emerged; and I have no doubt that this plays its part in strengthening and consolidating a régime which often seems to us in the West to be based mainly on force.

PUBLIC HEALTH

THE MINISTRY OF HEALTH AND CROYDON

Sir George Chrystal, secretary to the Ministry of Health, has sent a letter to the town clerk of Croydon in the following terms:—

I am directed by the Minister of Health to inform you that he has considered Mr. Harold Murphy's report on the public inquiry held by him into the causes leading up to the outbreak of typhoid fever in the county borough of Croydon in October and November, 1937. Sir Kingsley Wood, who has followed the course of the epidemic with the deepest concern, finds himself in agreement with the findings of the report which he has no doubt have been also studied by the corporation with the object of applying the lessons to be drawn therefrom for the guidance of their administration hereafter and in particular as affecting the conduct of their water-supply service.

The Minister is glad to observe that Mr. Murphy has been able to commend the skill and care with which cases of the disease were handled once they had been reported and the efficient character of the hospital arrangements, the nursing and the general medical services of the borough. On the other hand he cannot but feel that the corporation will share his disquiet at Mr. Murphy's finding (as regards the water service) that the organisation of the administration of the borough was such as to lead to "both misunderstanding and lack of communication between the responsible officers of the Corporation in connection with the work." Sir Kingsley Wood trusts that the corporation will at once review the *whole* field of their work in the light of this important consideration. A fundamental condition for the successful discharge of administrative responsibilities of the magnitude and complexity of those committed to the corporation is the effective collaboration and coöperation of all the branches and departments into which the work must of necessity be divided. Mr. Murphy's report enforces the painful reflection that if this obvious truth had been sooner and more perfectly realised the calamity which we now have to deplore might have been averted.

The Minister cannot too strongly impress on the corporation the necessity for giving their immediate attention to this serious criticism and he will be glad to be informed at an early date what steps they propose to take to remedy what experience has unhappily shown to be a grave defect in their administrative arrangements.

I am directed to request you to draw the attention of the corporation to certain other points in the report which he considers to be specially important.

The first is Mr. Murphy's finding that the borough engineer's duties covered so wide a range of matters as to make it impossible for him to give detailed personal attention to the highly important subject of water-supply, and his consequential suggestion that the Croydon water-supply should be under the direction of a fully qualified water engineer reporting to a water committee and keeping in close touch with the medical officer of health. The Minister commends this suggestion to the corporation. In his view the water engineer should be a chief officer of the corporation directly responsible to the water committee. He also considers it essential that the

water committee and the water engineer should work in the closest coöperation with the public health committee and the medical officer of health in all matters of common concern. He will be glad to be informed that the corporation are making the necessary arrangements.

Reference is made in the report to representations made at the inquiry that it would be of great advantage in dealing with an epidemic of this kind if there were means of securing closer contact and more ready communication between the medical officer of health and the general body of practitioners so that all the information available from time to time as to symptoms and possible causes could be pooled and distributed. While recognising that the sole responsibility for dealing with an outbreak must, as the report emphasises, rest with the medical officer of health, the Minister, as he has previously stated in Parliament and elsewhere, considers it important that all practicable steps should be taken to secure the effective coöperation of local practitioners in this as well as in other matters with which the medical profession, as such, is concerned.

The Minister appreciates the importance which the corporation doubtless attach to bringing the water from Addington well back into supply at an early date subject to necessary safeguards, and he does not dissent from the conclusion in the report that, with due attention to the gathering ground and suitable chlorination, there is no reason why the Addington well should not provide a perfectly healthy drinking water. The arrangements to be made for the treatment of the water are matters on which the corporation will no doubt seek expert advice and the Minister understands that they have already appointed consultants for this purpose.

In this connexion, the council will no doubt pay particular attention to the view expressed by Mr. Murphy on the evidence submitted that analysis of the water from the corporation's chalk wells should be made more frequently than has been the practice in the past.

In addition to the general and fundamental need for improved coördination of the work of the committees and officers of the council and to the particular points to which I have referred above, the report deals with a number of other matters which merit, and will doubtless receive, attention. The Minister will be glad to learn from the corporation at an early date the result of their consideration of the issues raised and to be informed generally of the action to be taken in the light of the report. If the corporation so desire, the Minister would be happy to arrange for his officers to discuss with them and their advisers any points arising on which it is thought they can be of assistance.

Croydon Town Council decided on March 1st to appoint a special committee of 11 to consider this letter and the report of the inquiry.

From Their Own Doctor

The main objective of the February stage of the national health campaign is to encourage the public to assist in the diagnosis of tuberculosis and the venereal diseases in the earliest stages, "and to take medical advice from the very beginning, from their own doctor, from the dispensaries and clinics of local authorities, and from the hospitals." In a letter to members of the London public medical service, the secretary, Dr. Alfred Cox, remarks that this is an aim that the service can whole-heartedly encourage. The family doctor can direct his patients where he thinks they will receive adequate treatment, and, what is very important, can keep his eye on possible family contacts. In no part of his practice can the doctor's tact and personal knowledge of the family be more useful. In the course of his letter Dr. Cox refers to "a common complaint made by general practitioners that health visitors are apt to urge every person they find with a cough, to see the tuberculosis officer whether there is a doctor in attendance, or not. This tendency should be fought every time it is encountered. Patients should be told that their doctor will see that they are sent to the tuberculosis officer if he thinks it necessary. A letter should be sent to the M.O.H. protesting against a practice which is perhaps justifiable when the person has no doctor, and cannot, or will not, afford to get one, but is quite unjustifiable when a doctor is available, as it is to subscribers to this service."

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 19TH

Notifications.—The following cases of infectious disease were notified during the week; Small-pox, 0; scarlet fever, 2287; diphtheria, 1590; enteric fever, 17 (30 "expected"); pneumonia (primary or influenzal), 1073; puerperal pyrexia, 166; cerebro-spinal fever, 41; acute poliomyelitis, 6; acute polio-encephalitis, 0; encephalitis lethargica, 3; dysentery, 185; ophthalmia neonatorum, 108. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 25th was 4822, which included: Scarlet fever, 812; diphtheria, 1321 (carriers 43); measles, 1361; whooping-cough, 284; puerperal fever, 16 mothers (plus 7 babies); encephalitis lethargica, 284; poliomyelitis, 1. At St. Margaret's Hospital there were 30 babies (plus 12 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there were 2 (0) deaths from enteric fever, 31 (5) from measles, 3 (0) from scarlet fever, 20 (3) from whooping-cough, 39 (3) from diphtheria, 55 (17) from diarrhœa and enteritis under two years, and 42 (4) from influenza. The figures in parentheses are those for London itself.

Stockport and Derby each reported a death from typhoid. Liverpool had 4 deaths from measles, Manchester 3. Liverpool also reported 8 fatal cases of whooping-cough. Diphtheria was fatal in 22 great towns, Birmingham reporting 6 and Liverpool 5.

The number of stillbirths notified during the week was 272 (corresponding to a rate of 42 per 1000 total births), including 36 in London.

THE SERVICES

Army Medical Services

Lieut.-General Sir James Hartigan, K.C.B., C.M.G., D.S.O., retired on March 1st from the appointment of director-general of the Army Medical Services after 38 years' service in the R.A.M.C. and on the Staff, and four years as head of the medical branch. The new director-general is Major-General W. P. MacArthur, C.B., D.S.O., O.B.E., K.H.P., who has been commandant of the Royal Army Medical College, Millbank, since 1935. He is succeeded at the college by Major-General W. B. Purdon, D.S.O., O.B.E., M.C., who has been professor of hygiene there since 1935. Colonel D. T. Richardson, M.C., moves from the War Office to take over the professorship.

Royal Air Force

Air Vice-Marshal Sir Alfred W. Iredell, K.B.E., C.B., K.H.P., retired from the appointment of director of medical services, Royal Air Force, on March 1st. He is succeeded by Air Commodore Albert Victor John Richardson, C.B., O.B.E.

CORRESPONDENCE

LUMP-SUM SETTLEMENT OF COMPENSATION CLAIMS

To the Editor of THE LANCET

SIR,—Your comments on the conclusions reached by the departmental committee on the maintenance of the lump-sum settlement by agreement of claims by injured workmen against their employers will be welcomed by those with experience of the disadvantages of such settlements. The distinction you draw between lump-sum settlement and settlement is also an important one.

Some of the details of the figures you mention as having been supplied by the rehabilitation division of the New York City Education Department in 1936 are illuminating. The effect of settlement upon the health and earning capacity of 322 men whose claims had been settled by lump-sum payment of £200 or over were studied by following them up for three years. Less than 3 per cent. of the men made a complete recovery after settlement, and the rest of them could be divided into three equal groups, each group covering about a third of the total number, that is about 100 men. One group recovered sufficiently to return to their pre-accident work or similar work; but of this group only half were at work at the time that the investigation closed and their average wage was less by 43 per cent. than their pre-accident wage. The second group had made some improvement but not sufficient to enable them to return to their previous work; of this group again half had found work of a light character, their average wage being down by 54 per cent. The third group had made no improvement at all; only 17 per cent. of them were doing any work and that at a wage reduction of 62 per cent.

A special analysis was made of those patients—64 out of 322—labelled "neurotic." Of these, 1 had made a complete recovery; 13, though not entirely free from symptoms, were fit for their full pre-accident work; 18 were in fair health but 32 did not improve at all. Only 17 of the 64 had received any positive stimulation from the settlement, and in 6 of these the effect was so slight that it was scarcely apparent. Finally, of the 64 "neurotic" men only 17, or 27 per cent., were employed; whereas of the other 258 men 105, or 41 per cent., were employed. Thirteen of the families—i.e., 20 per cent.—were dependent on charity. These detailed figures certainly, as you suggest, support the evidence given by the witnesses from the Ministry of Pensions that such settlements are not always in the best interests of the claimants.

There is as much positive evidence available for study on the fate of lump-sum settlements as there is upon their therapeutic value. Of the 322 cases only 4 per cent.—had invested their money successfully and even among these the average weekly return was only 26 dollars—little more than what they previously received in weekly compensation. At the end of three years only 8 out of the 322 men were still in possession of over 80 per cent. of their money; only 24 had more than 40 per cent. of the original sum; and of the rest only 64 had any money left at all. About two-thirds (207) of the men had used some of their money to settle debts; 271 had used some for living expenses (surely the idea for which the sum was intended); 140 had spent money on legal services, 46 on medical expenses, and 59 had used their money to go into business. Of these 59, 29 had failed altogether, 14 were earning little more than their previous weekly compensation payments, and 16 were earning considerably less than their previous weekly compensation and were considered to be on the borderline of failure.

In these 322 cases, then, it is clear that the settlement of the claim played a very small part in rehabilitation. The receipt of a weekly allowance for a specified time is likely to encourage resumption of orderly habits of life and work, while the sudden acquisition of a large sum by a man who is not accustomed to think in terms of banking accounts or investments is apt to be disastrous.

I am, Sir, yours faithfully,

H. ERNEST GRIFFITHS.

Harley-street, W., March 1st.

CONTRACEPTION AND FERTILITY

To the Editor of THE LANCET

SIR,—It is regrettable that a question relating to the results of birth control in general should degenerate into an attempt to defend the proceedings of any particular society which exists for that proclaimed purpose. Dr. Malleson takes the extreme case of a recently married, pregnant woman, maintaining an unemployed husband, to justify the practice of immediate birth control on marriage: but does she really believe that equivalent justification exists in more than a very small fraction of cases in which immediate birth control is applied? There are grounds for objection to the insidious surrender of our racial strength to the short-sighted sympathies of birth control societies and the like, and to the profit-seeking activities of commercial companies.

The threat of war to an empty Empire, and the economic difficulties which must arise during the shrinkage of our population, are issues which ought to be realised now. The subject of birth control is one for national review and national policy, since it is of nation-wide prevalence and of Imperial concern. It is time for the control of birth control.

I am, Sir, yours faithfully,

GEORGE H. ALABASTER.

Welbeck-street, W., Feb. 27th.

To the Editor of THE LANCET

SIR,—Not without reason did the ancients name the delicate arrangement of the ciliated epithelium of the cervix the *arbor vitæ*, a tree that the thunder of the National Birth Control Association and its *rondcuirs* would destroy root and branch in their adherence to and advocacy of highly acid chemicals and the septic finger application of various caps before or in the early days of matrimony.

Quite apart from ethical, religious, or sociological reasons, surely they do not maintain that such fronded epithelium is likely to be unaffected by such irritants, and will accept the conclusive evidence and experience of Gardner Child (p. 89), Beckwith Whitehouse (p. 429), Blair-Bell (p. 336), Meaker (pp. 39 and 125), and others, that such irritation gives rise to conditions which "make the endocervical mucus inimical to spermatozoa by creating a viscosity—such viscosity is a hostile factor, in that viscid secretions impose a barrier which spermatozoa are rarely able to surmount." It was this condition which Mr. Alabaster referred to and which goes on to the erosion and endocervicitis so commonly seen in contracepting patients.

Seeing that the social, economic, and imperial policy of this country depends upon an increasing rather than a decreasing population, surely the promiscuous donation of advice to nulliparous young women is antisocial, however good the reasons may be for giving such to parous women who would wish to space their childbirths. Only such advice, I understand, is given in the clinics of the Constructive Birth Control Society. Admittedly the problem is a thorny one but it is not without interest to observe that orthodox Jewesses and Roman Catholics are rarely found (in the absence of hypoplasia) to be sterile. Why?

I am, Sir, yours faithfully,

V. B. GREEN-ARMYTAGE.

Harley-street, W., Feb. 25th.

To the Editor of THE LANCET

SIR,—It is misleading to speak of "contraceptive measures" having this or that harmful result without explicitly stating which measures were used and by which type of human subject. Fifteen years ago I had already codified (Contraception, its Theory, History, and Practice, London, 1923) more than 60 physiologically, chemically, and physically different types of contraceptives; of many of these not less than hundreds of different commercial brands exist. Some of these doubtless have the bad effects described, but it should not be forgotten that I laid down as the slogan of the pioneer birth control clinic "Never put in the vagina what you would not put in your own mouth"; when this rule is observed the contraceptives used cannot have the bad effects attributed to "contraceptive measures" (unspecified) by Mr. Green-Armytage.—I am, Sir, yours faithfully,

London, W., Feb. 23rd. MARIE C. STOPES.

To the Editor of THE LANCET

SIR,—As a member of the medical subcommittee of the National Birth Control Association, I should like, if I may, to reply to the letters from Mr. Green-Armytage and Dr. Alabaster in your issue of Feb. 19th. There seems to be some misconception in their minds as to the point which we were attempting to make. Surely everyone who has dealt with cases of sterility (and many such cases come to the birth control clinics) will agree with Mr. Green-Armytage and Dr. Alabaster when they stress the importance of cervicitis and abnormal cervical secretions as factors in the production of infertility. Nor did we wish to raise the moral, social, and obstetric issues involved in the deliberate procrastination of pregnancy. For again we are probably in agreement with your correspondents that there is much to be said on all these counts in favour of child-bearing early in a woman's life. The mere postponement of the first pregnancy, by whatever means, is in itself conducive to sterility, since fertility in the female decreases rapidly with age. The point which we do not consider proven, and about which we wish to join issue with Mr. Green-Armytage, is his contention that the use of certain contraceptives (caps and acid chemicals) before the first pregnancy increases the incidence of cervicitis.

This suggestion of his that infection of the cervical canal commonly follows the use of a cap is a grave one and has far-reaching implications; but it is unconvincing. Might not the bacteria introduced during normal coitus be equally culpable? Those of us who draw our patients from rural areas, where the use of chemical and mechanical contraceptives in early married life is still extremely rare, can quote many cases of nulliparous women who are found, on examination, to have cervical erosions and other evidence of cervicitis. With regard to his point about the upsetting of the physiological *p*H of the vagina, there does not, at present, appear to be any satisfactory evidence that the introduction of acid substances into the vagina has more than a transient effect (owing to the excellent buffering action of the vaginal and cervical fluids) or that the mere lowering of the vaginal *p*H (except by solutions more strongly acid than those used in contraception) can cause erosion of the cervix and cervicitis. These points are actually being investigated by the committee. If the things of which Mr. Green-Armytage complains are liable to induce cervical infection and subsequent sterility in nulliparæ, then why will they not do so equally in multiparæ whose cervices are already more or less damaged? Yet all the evidence accumulated at the birth control clinics, from thousands of cases, indicates that the use of caps and chemicals has no tendency to induce sterility; indeed the fact that they do not do so is often embarrassing to the clinic workers. Not uncommonly cervices which at the first examination are seen to be in a highly infected state clear up after the woman has been using a cap and chemicals for some months.

Mr. Green-Armytage is the plaintiff in this case and the onus of proof lies on him. Without a control series of observations on nulliparous women who have used no contraceptives and an estimate of the percentage of newly married couples (fertile and infertile) using contraceptives, he is expressing nothing more than a pious opinion. Definite information, however, is being collected by that most valuable body, the Population Investigation Committee. We are fortunate in having Mr. A. C. Palmer as the chairman of the medical subcommittee and Mr. L. C. Rivett as a member; and I may add that this committee is not biased in favour of contraception but was appointed, in an attempt to safeguard the public, to investigate and evaluate contraceptive methods, appliances, and chemicals at present in use. The conclusions of this committee are not conjectural but are based on direct clinical observations of thousands of cases and scientifically conducted experimental work. An effort is being made to arrive at the true facts without prejudice. Methods are submitted to controlled clinical trial; rubber appliances and chemical products are subjected to stringent tests for efficiency and harmlessness before they are placed on the committee's list of approved goods. The committee is at present engaged in an investigation into the effect of chemicals on the cervix and would be grateful for any relevant facts and figures which Mr. Green-Armytage might care to place at its disposal.

I am, Sir, yours faithfully,

MARGARET C. N. JACKSON.

Crediton, Devon, Feb. 28th.

VENOUS THROMBOSIS AS A SIGN OF VISCERAL CANCER

To the Editor of THE LANCET

SIR,—In justice to Trousseau and in fairness to myself I feel it necessary to point out that the last paragraph of your annotation of Feb. 19th (p. 448) is misleading, for it suggests that Trousseau regarded venous thrombosis as a sign of gastric cancer only. In my paper in the *Birmingham Medical Review* last December, I translated the statement of Trousseau's into the following words:—

"On several occasions I have asked you to notice that this obliterative phlebitis did not pertain

exclusively to cancer of the stomach, and that it might occur with cancer affecting any internal organ whatever."

Inasmuch as I reported a case in which thrombosis was the earliest sign of cancer in the tail (*not* head as stated in your annotation) of the pancreas I may fairly claim to be innocent of the error attributed to me. I would add further that since the appearance of my paper I have seen a case in which recurrent thrombosis of the veins of the legs was the only symptom and sign of malignant disease of the prostate.

I was ignorant of the fact that Trousseau himself showed this sign in his fatal illness and am grateful to Dr. J. D. Rolleston for his letter.

I am, Sir, yours faithfully,

A. P. THOMSON.

Edgbaston, Birmingham, Feb. 25th.

To the Editor of THE LANCET

SIR,—I am interested in Dr. J. D. Rolleston's remarks on Trousseau's observation on a "phlegmasia alba dolens" in a limb as a diagnostic sign that a gastric (or other abdominal) disease is cancerous. What is the actual pathological explanation of the occurrence of the venous thrombosis in such cases? J. H. Pleasants, in his analysis of obstruction of the inferior vena cava from all causes (*Bull. Johns Hopk. Hosp.* 1909, **20**, 292), collected 88 cases connected with neoplasms, 46 of which were due to tumour-thrombosis—by which it is meant, I suppose, that tumour-cells are present in the thrombus. Seventeen cases were due to pressure from the tumour. It seems unlikely that the venous thrombosis in the Trousseau type of cases is due to the actual presence of cancer cells in the thrombus. Moreover, not every venous thrombosis in cases of abdominal visceral carcinoma is like "phlegmasia alba dolens." It seems that nowadays in the numerous cases of visceral cancer in hospital wards, observations confirming the truth of Trousseau's pronouncement are seldom of any practical diagnostic value.

I am, Sir, yours faithfully,

London, W., Feb. 26th. F. PARKES WEBER.

USE OF NITROUS OXIDE BY MIDWIVES

To the Editor of THE LANCET

SIR,—In a very important annotation in to-day's issue you remark that the chance of gas-and-air machines falling into disfavour does not lie so much in any risk from their use as in their occasional inadequacy. This risk is a very real one, but it is my experience that if the attendant pays close attention to small details, gas-and-air analgesia in labour is seldom inadequate. Attention to these details is absolutely essential, and it is necessary to adjust correctly the proportion of nitrous oxide to air.

The original Minnitt machine gave a percentage of nitrous oxide that varied with each breath the patient took. It was found on analysis that with very deep breathing, approximately 45 per cent. nitrous oxide in air was obtained, but with very shallow breathing the percentage rose as high as 70. Actually in practice this worked out very well, and it has been my experience that the vast majority of patients obtain quite adequate relief from the use of Minnitt's machine. I believe that this is largely because of the varying percentage of gas.

The new machine produced by the British Oxygen Company gives a constant percentage of nitrous oxide in air, however the patient breathes. There is a dial attached to the machine and, by turning this, the percentage of nitrous oxide can be varied at the will of the attendant; but midwives are not allowed to do this and must give the gas and air with the dial locked at "normal," which is 45 per cent. nitrous oxide.

I have gone very carefully into this question of the strength of gas and I have found that 45 per cent. is usually too little. In a series of cases recently I gave nitrous oxide in air from the British Oxygen Company's machine and turned the dial until I had got what I thought was the correct percentage of gas. I then locked the dial and sent the machine to the British Oxygen Company for analysis. The company reported that the percentage given was 64·4 nitrous oxide in air. I have since done another series of cases at this strength. At the Wellhouse Hospital and at the British Hospital for Mothers and Babies two of the British Oxygen Company's machines have been in use locked at approximately 60 per cent. nitrous oxide in air and this has been found to be the optimum. I think that all machines of this type which are placed in the hands of midwives should be sent out giving 60 per cent. of gas and I am quite sure that no ill effects can result from using a mixture of this strength. To persevere with the fixed 45 per cent. is going to lead to a large number of failures.

There are certain other points to which it is very desirable that careful attention should be paid. The type and fit of the face-piece are vitally important, and the patient must clearly understand how to breathe in the gas. We so often find, for example, that when the pushing-down stage comes, the patient simply puts the face-piece on her face and pushes. She must, however, be persuaded to take five or six breaths of gas and then to hold her breath and push; more breaths, hold her breath and push again. I often hear patients say that they do not obtain sufficient relief just at the last, but I have found that this difficulty can be overcome by giving continuous gas and air after the head is "crowned." Some years ago when I visited the Royal Free Hospital to study their work with nitrous oxide and oxygen in labour, an anæsthetist, Dr. J. M. Oldaker, told me how important it was for the patient to take a few breaths of gas after the pain has gone away, and I have found that these extra few breaths of gas are equally helpful when nitrous oxide and air is being used. If, for example, the pains are coming frequently, the patient can by this means keep herself to some extent under the influence of gas between the pains, so that she does not have to start anew (as it were) with each pain.

It would indeed as you say be a matter for profound regret if the conscientious midwives become impatient with gas-and-air analgesia because it did not provide the relief required. I am convinced from my own observation of a number of cases, now actually running into thousands, that inadequate analgesia is due to an inadequate attendant or to an inadequate proportion of gas in the mixture.

I am, Sir, yours faithfully,

Station-road, New Barnet, Feb. 26th. JOHN ELAM.

STREPTOCOCCAL MENINGITIS

To the Editor of THE LANCET

SIR,—From Mr. E. D. D. Davis's letter in your issue of to-day's date, which refers to mine published on Feb. 12th, I fear that I did not make my meaning clear. I believe that the symptomatology of streptococcal meningitis secondary to infection on the outer surface of the dura mater is a combined anatomical and bacteriological problem. Anatomically that

secondary to disease of the nasal fossæ should be separated from otitic meningitis. Bacteriologically that which arises from an acute invasion of the previously unaffected middle-ear cleft must be kept distinct from that which complicates chronic otitis media. In my teaching I am trying to persuade the younger members of our profession—not only the otorhinologists—to keep distinct these three clinical types.

I do not ask Mr. Davis to follow me; but, after I have carefully sorted them out, I must ask him not to throw them all together again and then to apply to the mixture words that I have used in reference to one type only.

The words "such cases" in the sentence "neck rigidity in such cases is the first and should be the only symptom" refer in my letter to the "meningitis secondary to an acute infection of the previously unaffected middle-ear cleft." Mr. Davis quotes them as referring to "streptococcal meningitis" in general and to his "notes of cases of meningitis, 35 secondary to ear infection and 16 to nasal infection" in particular. In doing so he "challenges" them as a statement of mine which, under these circumstances, they are not.

My contention is that it is useless any longer to quote such cases as those of Mr. Davis in which no distinction is made as to the pre-existing condition of the middle-ear cleft. We must collect new cases and describe the symptoms of each group. Then it is possible that we may be able to explain the discrepancy between his statements and mine. Two of his are inapplicable to the cases that I see fairly often in the fever hospitals and occasionally here. Perhaps Mr. Davis does not see them; but then he should not apply to them statements based on observations made upon cases of a different type; or infer that my observations are wrong because he applies them to clinical cases about which I was not writing.

I am, Sir, yours faithfully,

Guy's Hospital, S.E., Feb. 26th. T. B. LAYTON.

To the Editor of THE LANCET

SIR,—A letter from Mr. Layton (Feb. 12th) on the subject of meningitis commands the attention and respect of all, and I should like to thank him for his kindly criticism of my paper which you published on Feb. 5th. I wish that I had made it more clear that the paper referred solely to those cases in which meningitis was the only intracranial disease.

We both agree upon the value of neck rigidity as an early sign of meningitis, but surely it cannot be called the first *symptom* even if one hopes that it will be the only *sign*. I have only once heard a patient with meningitis complain of neck stiffness, and that was after a day of severe headache, some photophobia, and several attacks of vomiting.

Increased mental activity can be seen in all forms of acute meningeal inflammation and is not in my experience limited to those caused by the hæmolytic streptococcus. It may be that this feature is more marked in fulminating streptococcal cases because of the septicæmia that not infrequently coexists.

As regards the cases secondary to ear disease, I entirely agree with Mr. Layton that it is important to differentiate between those cases that follow a primary acute infection of the middle-ear cleft and those secondary to long-standing chronic suppuration, because in the latter group there is usually some associated lesion of the dura mater or cortex that requires urgent surgical attention. This class of case was beyond the scope of my paper, one of the main objects of which was to stress the importance of differentiating between those cases following rapidly on the heels of an acute otitis media and those that are seen after one or more weeks of ear discharge or after an operation for acute mastoiditis.

In fulminating cases the disease rushes through the pre-formed spaces in the temporal bone unhindered, to infect the meninges before it has had time to attack the bone. There is no call here for anything more than the simple drainage of pus. At this stage any extensive removal of bone may result in further dissemination. This principle is realised in dealing with acute labyrinthitis and should in my opinion be extended to the cases under consideration.

When acute disease in the middle-ear cleft has had sufficient time to involve the surrounding bone then, and only then, should eradication of the whole disease be considered. Sulphanilamide is a powerful, possibly the most powerful, weapon with which to fight streptococcal meningitis. It should be used without delay and in adequate doses in every case of streptococcal infection where extension to the meninges is suspected. There is no need to wait for the result of a culture of bone removed at operation, any more than there is need to wait for the appearance of a streptococcus in the spinal fluid. We should try to anticipate these events by giving sulphanilamide at the earliest opportunity.

Finally, I think that from the point of view of management there is no essential difference between cases of otitic and nasal origin. In both, the most acute stage calls for the minimum of surgical interference. In cases of longer standing the need for surgery may be urgent; whilst where there is an acute flare-up of a chronic process the need for surgery is imperative, to deal not only with the primary focus but also with some intermediate focus in the dura or brain tissue itself.

I am, Sir, yours faithfully,

TERENCE CAWTHORNE.

Harley-street, W., Feb. 28th.

To the Editor of THE LANCET

SIR,—Mr. Layton says that he has yet to see a case of otitic meningitis secondary to acute invasion of the previously unaffected middle-ear cleft saved by sulphanilamide. Mr. E. D. D. Davis states that in his experience 98 per cent. of cases showing neck rigidity have died in spite of vigorous treatment. The following case may be exceptional, but I think justifies a better prognosis than these two statements suggest.

A boy of 6½ was admitted to the Harrogate General Hospital at 6 P.M. on Nov. 3rd, 1937, with a history of earache on Nov. 1st followed within 24 hours by profuse ear discharge, vomiting, and a temperature of 105·6° F. On admission his temperature was 102·4°. The mastoid was slightly tender at the apex but not red or swollen. The following day (Nov. 4th) there was slight neck rigidity, but Kernig's sign was negative. Lumbar puncture showed turbid fluid under slight pressure. A cortical mastoid operation was done at 5 P.M., pus being found in a few surface cells and the antrum region only. No dura mater was exposed. Ten c.cm. of antiscarlatinal serum were given. The temperature which had risen to 104° after the lumbar puncture rose to 105° after the operation. Pus from the mastoid and the cerebrospinal fluid both grew *Streptococcus hæmolyticus*. Next day, Nov. 5th, head-retraction was more marked and Kernig's sign positive. Treatment with Prontosil was then started and continued daily. No further serum was given. For four days (Nov. 4th to 8th) the child was delirious and incontinent. On the 6th lumbar puncture was repeated, the fluid showing fewer organisms. On the 8th improvement commenced and it was steadily maintained. After Nov. 15th the prontosil, which had till then been

given intramuscularly, was given by the mouth. A month later the mastoid was completely healed, the ear dry, and the hearing normal.

I think this may be fairly described as "a case saved by sulphanilamide."

I am, Sir, yours faithfully,

Harrogate, March 1st. A. B. PAVEY-SMITH.

CONTROL OF A TYPHOID EPIDEMIC

To the Editor of THE LANCET

SIR,—Surely it is Dr. Taylor's arithmetic that is at fault. His "epidemic" (consisting of five cases), ceased before general inoculation. Dr. Taylor has no justification for the belief that any of the contacts with his cases diagnosed on May 30th, June 1st, June 4th, had contracted enteric. He must be aware of the general opinion of experienced practitioners who maintain that there is a negative period after the inoculation during which infection is more likely than in the uninoculated.

Dr. Taylor has no right to compare the conditions in the Basque children's camp with those obtaining at Croydon or Bournemouth. At Croydon there was a polluted water-supply. The victims actually drank this polluted water. At Bournemouth, milk was blamed for the epidemic, and it was estimated that the incriminated supply went to 10,000 persons. Here again, the milk was polluted by contaminated water. The Basque children drank neither contaminated water nor contaminated milk. As for contact infection it is well known that this is comparatively rare. As soon as the typhoid cases were discovered at the Basque camp, they were isolated and none of the other children was again in contact with them.

Your readers are well aware that if any of the children had developed typhoid fever after inoculation, the excuse would have been made that they had contracted it before inoculation was carried out. I repeat that the experience of the Basque children proves once again that typhoid fever can be prevented by strict attention to sanitation, and I maintain that no amount of inoculation will stop a typhoid epidemic, if pollution of food or drink continues.

I am, Sir, yours faithfully,

REGINALD F. E. AUSTIN.

Queen Anne-street, W., Feb. 12th.

*** We have shown this letter to Dr. Taylor, who writes as follows: "Major Austin states that the Basque epidemic of five cases ceased before general inoculation. At the time I should have been very happy in that belief, but on the contrary I confidently expected many more cases, and tentative arrangements were made by the local authorities for their reception. The first two cases contracted the disease in Spain, the three subsequent cases were probable contacts, and there is no reason to suppose that the goddess of chance having ruthlessly torn these half-starved children from their distant homes should suddenly endow them with a typhoid immunity.

"The control of all epidemics is the same once the polluted source has been discovered and removed—i.e., the problem of contact dissemination. Major Austin states that I have no right to compare the Basque outbreak with the epidemics of Croydon and Bournemouth. When the Addington well was shut down and the infected dairy at Bournemouth closed, then their problem was the same as ours, except that we were in a much worse position. We, of course, did all we could in camp sanitation and hygiene, and provided good food and clean water, but we possessed no elaborate drainage and sewerage systems. Roughly speaking, 4200 alimentary tracts were collected in an emergency camp in a 40-acre field, with open latrines to add to the sanitary problem. Our three proved cases had been living in crowded bell tents. I cannot imagine a happier state of affairs for any active typhoid bacillus.

"He minimises the risk of contact spread, but even doctors and nurses have been known to contract the disease from patients. Public health authorities supervise all contacts of known cases because of this danger.

"Major Austin has raised once again the question of negative phase. The *Lancet* and the *British Medical Journal* both published leading articles on typhoid immunisation and begged to differ. Many eminent authorities agree that the risk of negative phase can be ignored. It is probable that inoculation carried out in the early stage of incubation prevents the disease, but that there is a risk of provocation typhoid in the late stage. I have not yet met any evidence that provocation typhoid has produced a fatal result, but I would point out that enteric fever has a high fatality-rate, and for that reason prophylactic inoculation has a definite place in preventive medicine.

"It will be of interest to learn whether contact inoculation has been employed in the two recent epidemics and with what result."—ED. L.

A HYPOTHETICAL CASE

To the Editor of THE LANCET

SIR,—Your invitation (p. 506) to discuss a hypothetical case in medical journalism is timely posed, for the demand for doctors in Fleet-street to-day is brisk.

Ordinary writers detected in recommending their own books to correspondents are usually in risk of dismissal unless their editor has previously agreed to allow them this form of gratis advertisement. Doctors might not be so sharply treated. For them the question turns on the so-far undefined ethical rules of press writing. I consider these to be:—

(*a*) The anonymity of a Fleet-street doctor must remain complete so long as he is in any form of private practice; but he should not hide behind it when seeking information from his professional colleagues.

(*b*) His gain must be limited strictly to what the paper pays him, and his writing must seek to win him more readers but not a single extra patient.

(*c*) Advice to correspondents should take the form of suggestions to be laid before their doctor for comment. Serious queries are thus helped, and a stopper put on frivolous ones. Furthermore it is an essential safeguard to a man advising people who may be omitting essential facts.

(*d*) His own discoveries and publications are banned matter even in the most indirect form. How otherwise can he claim any impartiality?

A book published under a pen-name may therefore quite properly—the editor assenting—be recommended to readers whereas rule (*d*) should be rigidly applied to books appearing under the true name. The danger of abuse is otherwise very real, although hard cases exist where books have been written by men "in the course of an honourable professional career" whose matter and manner are such that their recommendation to a wide circle would result in no more than a gain from royalties.

In defence of Fleet-street may I say that the sense of responsibility of news editors in medical matters is greater than is generally believed? They are quick to spot the medical publicity-hunter, and disinclined to encourage medical writers who say things they

(*Continued at foot of opposite page*)

OBITUARY

ALFRED DOUGLAS BIGLAND, M.A.Camb., M.D. Liverp., F.R.C.P. Lond.

THE death of Dr. Douglas Bigland at the age of 51 came after many years of chronic illness. For the past year it had been clear to his friends that he was seriously ill, and in the last six months he was largely confined to his house, though still hoping that he might recover sufficiently to get back to his hospital and consulting practice. He died on Feb. 20th.

A. D. Bigland was the only son of the late Mr. Alfred Bigland, M.P. for Birkenhead East. After leaving Birkenhead School he went to Cambridge and then Liverpool, where he graduated in medicine in 1912. In 1919 he became a member of the Royal College of Physicians of London and was elected a fellow in 1935. After graduation he was house physician and later medical registrar at the Liverpool Royal Infirmary. On the outbreak of war he joined the Red Cross and then the Royal Army Medical Corps, serving at Suvla Bay, in Egypt, and in France. Before the end of the war he was invalided home and returned to Liverpool; soon afterwards he was elected honorary physician to the David Lewis Northern Hospital. At that time he was especially interested in neurology and he established a neurological clinic at that hospital. In 1923 he became assistant physician to the Liverpool Royal Infirmary, acting as junior colleague first to the late Dr. John Owen and later to Prof. John Hay.

The rigours of his war service brought on an illness which was ever afterwards to hamper his career, prevent him from developing his full powers, and by its interruptions to his consulting work place him in a position of insecurity, and finally cause his death. In 1930 his first wife, Dr. Phoebe Powell Bigland, died after a long illness; shortly after he himself fell ill again and he had to spend the best part of two years lying on his back. He returned to work again, and in 1934 was elected to a full physicianship at the Royal Infirmary. Other posts which he held were those of consulting physician to the Maghull Home for Epileptics and the Lancashire Mental Hospital, Rainhill. He was a lecturer in clinical medicine in the University of Liverpool, and he acted as sectional editor to the Tropical Diseases Bureau, covering the subject of pellagra. In his later years he became very interested in asthma, and established a flourishing asthma clinic at the Royal Infirmary.

"*Souffrir passe; avoir souffert ne passe jamais*"; his suffering refined and mellowed him. "To the end," writes one of his friends, "he retained a brave, gay, and lovely spirit. He had learned to enjoy and treasure what he felt were the important things—to do his work to the best of his ability, to earn the gratitude and confidence of his patients, and to possess the respect and friendship of his students and colleagues. He had long made his peace with the limitations which his illness forced upon him; he had a grand courage to go on as long as ever he could, and to accept the fact that he could not do all he wished to do."

Bigland was a sound clinician, proud to follow in the clinical tradition of his old teacher, Dr. John Hill Abram, whom he often quoted. To him, the patient always came first, and he deliberately made time for those little personal touches which made his patients feel that while he was with them his care and thought were entirely for them individually. He was a good teacher, simple and direct. Perhaps he was at his best at his hospital ward rounds, for in spite of his serious sense of responsibility to patients and students, he had a great sense of fun which bubbled up to the delight of patient, nurses, and students alike. But the peals of merriment which at times interrupted the decorum of a formal ward visit brought confidence to the patient and usually rammed home for the student some fundamental piece of clinical knowledge.

A little over three years ago he married again, and he leaves two daughters by his first marriage.

DR. JOSHUA BOWER DALTON, who died at a nursing-home in Leicester on Feb. 23rd, was a familiar and popular figure in the schools of the county where he had been assistant school medical officer for the last seventeen years. He was a Manchester graduate and after qualifying in 1905 held various appointments before the war when his foreign service left him with some defect of sight. He never allowed this however to interfere with his work, which brought him into contact with a large proportion of the school population by whom he was looked upon not only as doctor but as friend. He was 58 years old.

Squadron Leader DAVID EDMUND STODART, M.B., whose death is reported, was the son of a medical man, D. E. Stodart, F.R.C.S., and himself graduated in medicine at Edinburgh. It was as a combatant officer, however, during and after the late war that he gained distinction. Joining the Royal Flying Corps as a pilot in 1914, soon after taking his medical degree, he served throughout the war and was decorated with the D.S.O. and D.F.C., one of his feats being to perform all the duties of an entire flight, "a record which it would be difficult to surpass." After retiring from the Royal Air Force in 1931 he worked for a time in the dermatological department at the Middlesex Hospital. In 1934, when 52 years of age, he took part in the air race to Melbourne.

(*Continued from previous page*)

would be ashamed to have related before a jury of their colleagues.

Will you allow me, Sir, lest I seem to boost myself or my paper, to remain,

Yours faithfully,

A MEDICAL CORRESPONDENT.

London, E.C., Feb. 26th.

WESTMINSTER HOSPITAL MEDICAL SCHOOL.—A porchway and entrance to the medical school has been opened by Lord Wigram in memory of Kenneth Alfred Wolfe Barry, a former chairman of the hospital.

PANEL AND CONTRACT PRACTICE

Police Station Calling

THE Medical Practitioners' Union asked the Ministry of Health to give a ruling on the responsibility of an insurance practitioner towards an insured person who has fallen into the hands of the police on a charge of drunkenness. The Minister felt unable to give an opinion except in so far as the question might come before him for formal adjudication on appeal or otherwise, but the real position of the practitioner in cases of this type can be found in the terms of service and is as follows: If the practitioner is summoned for the purpose of providing treatment for a patient who is ill and whose condition so requires, even if the condition is associated with intoxication, he must go provided the patient is within the area of his practice. A certificate of sobriety or otherwise is clearly not a certificate which is necessary for the purposes of National Health Insurance and the practitioner would have a perfect right to charge for it. If it was made clear to the practitioner that he was being summoned merely for the purpose of certifying as to sobriety it would be a matter for his own determination whether he went, and if so upon what financial consideration. If the patient was at a place beyond the area of the doctor's practice the practitioner's responsibility in the matter of visiting for the purpose of providing treatment would be exactly the same as if the insured person had developed an ordinary illness. To sum up, the question to be decided in any specific case is whether the service required is medical treatment and attendance within the meaning of the Act and regulations. If it is, the doctor's responsibility is defined in the regulations; if it is not, his course of action is exactly as if the accused person were one of his private patients.

The Extension of Insurance Medical Services

Dr. H. Guy Dain, in an address which we summarised last week, expressed a belief that if the health insurance system were to be extended so as to become a complete medical service, that would for most practitioners virtually put an end to fee-paying practice. But he viewed the prospect without disquiet. In his opinion the essential feature in medical practice is not how the doctor is paid but what is his relation to the patient. The thing that really matters is free choice of doctor. Dr. Dain appears to have assumed that the introduction of a salaried service would necessarily abolish free choice of doctor, but this view is not generally accepted by the advocates of such a service. It is held that payment by salary need not wholly deprive the insured people of the right they have hitherto enjoyed to select their medical attendants, though it might be necessary to make some limitation of choice. A great increase in the number of persons coming within the scope of the service would probably facilitate the retention of a substantial measure of free choice of doctor. But such an extension of health insurance would cost money, and the debate in the House of Commons on Feb. 9th on national and local government expenditure showed that it will not be easy to find money for further extensions of social services. Most of the expenditure on the existing services, being statutory, increases automatically from year to year. For example, the provision made in 1937 for old-age and widows' pensions showed an increase of £10,500,000 over 1932. It seems safe to assume therefore that when it is thought that the time is ripe for the extensions of health insurance to which Dr. Dain referred, questions of cost reductions will become prominent, and it may appear that economies could be effected by the substitution of a salaried medical service for the present system of capitation payment. A careful examination of the position may show that such a change would not in fact lead to economy, but the question will doubtless arise, and it is well that it should be borne in mind in discussing extensions of health insurance.

Within the Scope

A practitioner gave an insured person a course of intravenous injections for tabes dorsalis and charged fees on the grounds that the service involved the application of special skill (the rest of the formula is well known). He submitted form G.P.45 but the local committee took the view that the service fell within the scope of his obligations. The insurance committee concurred but the last word is with the Minister, because Regulation 46 (4) provides that if on any question referred to the local medical committee under that regulation the insurance committee and the local medical committee are agreed, the committee shall report the matter to the Minister, and the Minister may, if he thinks fit, refer the question for decision to referees. But that does not often happen.

The Final Settlement

We are informed that insurance committees have now received the final figures for the 1937 practitioners' fund, and that the amount available for distribution by way of settlement is rather more than for 1936.

THE LANCET 100 YEARS AGO

March 3rd, 1838, *p.* 835.

An extract from an account of an investigation by M. L'ABBÉ GAILLARD *on:*

HIGH MORTALITY OF FOUNDLINGS BROUGHT UP BY THE HAND, COMPARED WITH THE MORTALITY OF THOSE SUCKLED

NUMBER of foundlings at Parthenay, 153; died in one year, 54; deaths out of 100 born, 35.

NUMBER of foundlings at X——, 244; died in one year, 197; deaths out of 100 born, 80.

Of 655 children received at X——, only 66 lived 12 years.

Struck with the enormous mortality at X——, the Abbé Gaillard ascertained that the children were equally well attended at the two places, but that at X—— the children were brought up by hand, instead of being suckled, as at Parthenay. The greater number of deaths at X—— took place in the first month after birth; and the mortality was at a maximum in autumn, a fact confirmed by many years observation at X——, and other establishments, where the children are not supplied with natural food. . . .

. . . it appears that of 244 children brought to the hospice in five years, 116 died in the course of the first month = 48 per cent.; that of 123 children born between January and June, 33 died in the first month; while 83 died out of 121, born between July and December. In the first months of the year the mortality was 27, in the last six months 67 per cent.; of 100 children born between January and June, 73 survived the first month; between July and December only 31 survived.

The mortality is raised by extreme cold; in November and December, 1829, out of 29 children admitted, 19 died in the first month after admission; in July and August of the same year 11 died in the first month out of 25 admitted.

These facts show very decidedly the evil consequences of denying infants their natural food, and furnish another argument against the fatal practices of those heartless mothers who abandon, or refuse to suckle their own offspring.

MEDICINE AND THE LAW

Fee for Emergency Operation in Hospital

A CLAIM for a ten-guinea fee for an emergency operation was successful at Rhyl county court last month. The patient was insured under the national health insurance scheme, which meant that, on production of his card, he could obtain free medical attention wherever he happened to be. He was also a member of a contributory scheme under which he could be treated at any voluntary hospital, the bill being paid by the authorities responsible for the scheme. He was taken ill while staying at Rhyl, and the doctor who attended him ordered his immediate removal to the Royal Alexandra Hospital in that town, where an emergency operation was performed. The maintenance fees of the patient at the hospital were duly paid under the contributory scheme. Later the patient received a bill for ten guineas; this charge, he contended, ought to be deemed as included in the hospital bill. The judge pointed out that the rules of the hospital showed it to be an institution for women and children. A ward had been established with a few beds for male accident cases and emergency operations. The rules clearly stated that charges for attendance in this ward did not include doctor's fees. Judgment was given for the doctor for the amount claimed, with costs.

Ophthalmic Surgeon's Successful Claim

In the Dover county court another claim for professional fees was successful. The patient had disputed the claim and his legal advisers had drawn up a defence and pleadings. When the case came into court at Folkestone, the judge suggested that it was one for reasonable settlement. During an adjournment the patient apparently received information from one of his own medical experts which made it impossible for him to contest the case further. He therefore submitted to judgment with costs, the judge allowing an increased fee for the expert witness whom the plaintiff surgeon had been obliged to call in order to rebut the patient's contention that the operation was either unnecessary or unskilfully performed. The substantial defence seems to have been that the needling of the eye for cataract either was of no use or ought not to have been performed and that the fees charged were excessive. These allegations being withdrawn, the plaintiff (represented by the solicitors to the Medical Defence Union) succeeded at all points.

Allegations of Negligence Fail

A claim for damages against an ear, nose, and throat surgeon failed at the recent Lincoln assizes. The plaintiff was a bricklayer's labourer. It was said that punishment administered to him as a boy resulted in his losing the hearing of his left ear. His case was that his right ear remained good, but in 1932 a swelling developed and his panel doctor sent him to the Lincoln County Hospital. Mr. J. J. Rainforth, F.R.C.S., the defendant, then gave him some treatment of which no complaint was made, and told him to return in a fortnight. He subsequently saw Mr. Rainforth again. The plaintiff alleged that the surgeon directed a nurse to hold his head in a vice-like grip, inserted a funnel in his ear, and did something with a needle. Everything then went black for him, said the plaintiff; on the way home he was staggering and reeling and from that moment onwards he could hear nothing at all. He continued his treatment under Mr. Rainforth at the hospital, and, when he last went there in February, 1933, was assured that his hearing would return in time. In 1937 he had seen a representative of a firm which supplied mechanical devices for the deaf, but nothing could be done for him. He had subsequently written to the defendant surgeon making apparently some financial demand. No reply being received, his solicitors claimed £2 a week until such time as the defendant could give him back his hearing. The defendant repudiated liability and said that the drum had been destroyed by old-standing disease.

Mr. Rainforth gave evidence of his first examination of the plaintiff. He was then very deaf; the drum of the right ear was largely destroyed by middle-ear disease. There was much granulated tissue (which bled easily) and debris. He could see into the middle ear which would not have been possible if the drum had been intact. He cleaned out the ear with cotton-wool and touched it lightly with a probe to test the consistency. He regarded the condition as serious. The plaintiff was deaf and the granulated tissue, if left untreated, would have been a menace to his life. He prescribed antiseptic drops. A fortnight later he saw the patient again and repeated the treatment. He never punctured the ear-drum; there was nothing to puncture. Nor was there anything to lance because the proud flesh was solid. He tried to get the proud flesh healthy, so that the skin would grow over it and heal it. Later the granulated tissue was much less and the skin was beginning to grow. Mr. Justice Finlay, while expressing sympathy for the plaintiff, said that there was no real evidence of anything having been done wrong by the defendant surgeon, nor was there anything in the plaintiff's evidence which was inconsistent with proper care on the defendant's part. He was perfectly satisfied that there had been no failure of care or skill on Mr. Rainforth's part. Judgment was given for the defendant, who was supported by the London and Counties Medical Protection Society, thus disposing of the plaintiff's allegation that the surgeon failed to use reasonable care and performed some kind of operation which was dangerous without obtaining the patient's consent.

THE REYNOLDS PORTRAIT OF JOHN HUNTER

THIS portrait, which has been in the cleaner's hands (see *Lancet*, Nov. 6th, 1937, p. 1117) is again on view in the Royal College of Surgeons. The astonishing change effected by the restorer, Mr. W. A. Holder, indicates the care and skill with which he has done his work, and all will be grateful to him and also to Sir Alfred Webb-Johnson for bearing the cost. In its recent state none of the picture was clear, and little save the face was readily recognisable. Now the face is clear and its complexion plain to see, the right hand is once more a human member, the rich colour of the habiliment is visible, and the well-known anatomical accessories are again displayed. These results show that the pigmentary changes of the picture's earlier period have made relatively little advance in later years—much less, indeed, than there was reason to fear. What is specially gratifying is that Mr. Holder authorises the statement that in his opinion the pigmentary deterioration has substantially come to an end, and that, given ordinary circumstances, the picture's present condition may continue indefinitely, subject to cleaning from time to time as required. What he did to the picture was to remove dirt and treat cracks; and, as already said, the result is as surprising as it is welcome. All this and the fact that the picture's recent deplorable state was due to dirt, not to continued decay, prompt the hope that in the future it will be cleaned somewhat oftener than twice in 150 years.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

IN the House of Lords on March 1st the National Health Insurance (Amendment) Bill was brought from the Commons, and read a first time. Lord Strabolgi introduced a Bill for the registration of hairdressers and to regulate the practice of hairdressing, and it was read a first time. The Royal Sheffield Infirmary and Hospital Bill, the Saint Bartholomew's Hospital Bill, the Blind Persons Bill, and the Population Statistics Bill were read the second time. The Poor Law (Amendment) (No. 2) Bill passed through committee.

QUESTION TIME

WEDNESDAY, FEB. 23RD

Additional Water-supplies

Mr. KELLY asked the Minister of Health the districts where additional water-supply had been provided and the districts where remedial measures were required.—Sir KINGSLEY WOOD replied: Of the 24 areas from which I received reports of shortage of water-supply in 1937 additional supplies have been provided for the urban districts of Brynmawr and Chatteris and the rural districts of Ashby-de-la-Zouch, Colne and Chippenham, Chichester, North Witchford, and Penistone; and the remedial measures required are under consideration in the boroughs of Dartmouth, Falmouth, Penzance, and Tiverton, the urban districts of Abertillery and Stone, and the rural districts of Belper (Turnditch Parish), Barnstaple (West Down Parish), Brackley (Sulgrave Parish), Bullingdown (Horsepath Parish), Hailsham (Lower Dicker Parish), Holsworthy (Black Torrington Parish), Horncastle (Bucknall Parish), Knighton (Kingward Parish), Morpeth (Cherington Parish), Truro (Cubert, Perranzabuloe, and Saint Erme Parishes), and Wisbech (Tydd and Newton Parishes).

THURSDAY, FEB. 24TH

Cost of Living and Working-class Budgets

Mr. LIDDALL asked the Minister of Labour (1) the approximate percentage increase in the cost-of-living index at December, 1937, as compared with November, 1933, in relation to all foods, commodities, and services required by working-class households for the production and provision of which coal was necessary; to what extent the increase in the index figure was due to the increase in the cost of coal; and if he would exclude from the calculations the additional approximate increase in the index figure caused by the rise in the cost of coal usually bought as firing for working-class houses and state it separately; and (2) the approximate cost-of-living index percentage rise at December, 1937, as compared with November, 1933, in relation to all commodities, in addition to or including coal usually bought for working-class houses, as a result of the increase in the cost of coal used for producing the usual commodities and services required by working-class households.—Mr. ERNEST BROWN replied: At Dec. 1st, 1937, the cost-of-living index figure showed a rise of 17 points, or nearly 12 per cent., as compared with Nov. 1st, 1933. During the same period there was an increase of about 10 per cent. on average in the retail price of coal used as fuel in working-class households; the effect of this increase was to raise the cost-of-living index figure by approximately nine-tenths of one point, or about two-thirds of 1 per cent. I regret that the information in my possession is insufficient to enable me to state to what extent the rise in the index number was due to increases in the cost of coal used in the production and provision of the commodities and services required by working-class households, and I am afraid it is impracticable to classify those commodities and services in two groups according to whether coal is or is not required for their production and provision.

Miners' Nystagmus in Durham

Mr. DAVID ADAMS asked the Minister of Labour whether he was aware that in the area of the Consett and Stanley employment committee there were at present 146 men who had suffered, or were suffering, from miners' nystagmus out of a total adult insurable mining population of 20,700, and that 75 of these were at present desirous of obtaining colliery work; and if, with a view to meeting this requirement, he would consult with all colliery owners in the area with a view to arranging for employment exchanges to bring to their special notice particulars of any of their ex-employees seeking colliery work who had contracted nystagmus whilst in their employ immediately they were certified fit for ordinary or light employment.—Mr. ERNEST BROWN replied: I am aware of the position to which the hon. Member refers, which has been the subject of careful inquiry by the Consett and Stanley employment committee. I understand that the committee has invited a panel representative of colliery work-people and employers in the area to examine a suggestion on the lines of that in the second part of the question and I shall be pleased to consider the matter further when I have received the committee's recommendations.

Slum Clearance

Mr. CRAVEN-ELLIS asked the Minister of Health whether, in view of the injustice arising out of the method of assessing compensation for slum clearance under the Housing Act, 1936, to thrifty people who years ago acquired with their small savings a few houses, he proposed to amend the compensation clauses.—Sir KINGSLEY WOOD replied: As my hon. friend will be aware Parliament has on several occasions affirmed the principle that the proper basis of compensation for houses found unfit for human habitation is site value, and this decision was again endorsed after full discussion during the passage of the Housing Bill of 1935. Certain amendments of the law were then made with a view to mitigating hardship, and in the circumstances, as at present advised, I do not contemplate further amendment of the law in this respect.

Delivery of Unwrapped Bread

Sir JOSEPH LEECH asked the Minister of Health whether he was aware of the insanitary way in which bread for human consumption was delivered at the residences of consumers by hand, from baskets or carts, and without covering; and if he would, in consultation with local authorities, devise some by-law to prevent the delivery of bread by this method.—Sir KINGSLEY WOOD replied: I would refer my hon. friend to Clause 14 of the draft Food and Drugs Bill recently issued with the third interim report of the Local Government and Public Health Consolidation Committee, which proposes to empower local authorities to make by-laws as to the handling, wrapping, and delivery of food.

Mr. BANFIELD: Is the Minister aware that the baking industry has for some years paid special attention to this problem with a view to giving the public their bread in the most sanitary condition?

Sir K. WOOD: I hope that is so.

Voluntary Contributors and Health Insurance

Mr. MAINWARING asked the Minister of Health if he could state to the latest available date how many persons had voluntarily entered insurance under the recent extension of the National Health Insurance Acts.—Sir KINGSLEY WOOD replied: Up to Feb. 16th 127,215 applicants had been admitted to insurance under the Contributory Pensions (Voluntary Contributors) Act, 1937.

Sickness Incidence Statistics

Mr. HAROLD MACMILLAN asked the Minister of Health whether statistics showing the incidence of sickness among women and girls in the insured population of England and Wales were tabulated at the Ministry; whether these figures showed the various age-groups and the types of sickness; and, if so, whether he would have the figures made available to the public.—Sir KINGSLEY WOOD replied: The information referred to by my hon. friend is not available in my department and it could be obtained only by reference to the detailed records of the 7000 approved societies and branches which administer health

insurance benefits. I am, however, considering the general question of a comprehensive investigation into the extent and incidence of various forms of incapacitating sickness amongst insured persons of each sex and at various ages.

Tyneside Boy's Death in Croydon

Miss WILKINSON asked the Minister of Health if he would cause inquiry to be made into the case of Alfred Frampton, aged 15 years, whose parents resided at 81, Albert-road, Jarrow, who was knocked down by a private motor-car on Oct. 26th, 1937, and taken to Mayday Hospital, Thornton Heath, and contracted typhoid while there, being then transferred to the borough council hospital at Croydon, where he died on Jan. 20th, 1938; and whether this transfer occurred during the typhoid inquiry.—Sir KINGSLEY WOOD replied: I much regret to learn of this unfortunate case. I have communicated with the town council on the matter and I will send the hon. Member the particulars I have received.

Rehousing Accommodation for Tuberculous Persons

Miss WILKINSON asked the Minister of Health whether he would consider making provision in the new Housing Bill for a special subsidy to local authorities for the rehousing of persons suffering from tuberculosis who were living under housing conditions prejudicial to their health. —Sir KINGSLEY WOOD replied: Under the existing Housing Acts local authorities may provide houses for persons suffering from tuberculosis and any houses so provided obtain the benefit of the existing subsidies. In addition, the authorities may grant rebates from rent in suitable cases. In the circumstances I do not consider that any special subsidy is necessary.

MONDAY, FEB. 28TH

Supply of Milk to Highland Children

Mr. ROBERT GIBSON asked the Secretary of State for Scotland whether school-children in the Highlands received milk on the same conditions as school-children in Greenock or Glasgow; and if he had any statement to make on the subject.—Mr. ELLIOT replied: The Highland counties, with the exception of the Western Isles and a part of Argyll, are within the areas of the Scottish Milk Marketing Board and the North of Scotland Milk Marketing Board. Throughout those areas the terms on which milk is provided for the milk-in-schools scheme are the same. In the rural areas generally, however, difficulties have been experienced in getting the milk-in-school schemes operating owing to the special problems of supplying milk to small schools in country districts, and there is accordingly a lower percentage of children receiving milk in schools in the Highland areas than in the towns referred to.

TUESDAY, MARCH 1ST

Birching of Young Persons in Scotland

Mr. WESTWOOD asked the Secretary of State for Scotland what action, if any, he proposed to abolish the birching of children and young persons in Scotland.—Mr. ELLIOT replied: The report of the Inter-departmental Committee on Corporal Punishment has just been received and until the Government has had an opportunity of considering it I regret that I am unable to make any statement on the matter referred to in the question.

Financial Difficulties of Scottish Hospitals

Mr. KENNEDY asked the Secretary of State for Scotland if his attention had been drawn to the increasing financial difficulties and debts of Scottish infirmaries and hospitals, showing that the system of voluntary contributions was no longer sufficient to meet the growing pressure of work in those institutions; and if he was contemplating action on the lines of the report of the committee on health services, published in 1936, with an increased measure of State aid.—Mr. ELLIOT replied: In reply to the first part of the question, I am aware that some of the voluntary hospitals have financial difficulties, but there is, I believe, no evidence that the voluntary system as a whole is unable to meet its commitments. As to the second part of the question, the many important and difficult problems involved are being carefully examined, but I am not in a position to make a statement.

Malnutrition and Tuberculosis among South African Natives

Mr. LEACH asked the Secretary of State for Dominion Affairs if his attention had been drawn to the evidence given by Dr. E. H. Cluver, deputy chief health officer of the Union to the Native Labour Committee in South Africa, that three-quarters of the native population was under-fed and that tuberculosis was increasing; and what steps he was taking to prevent these conditions spreading to the neighbouring British protectorates.—Mr. M. MACDONALD replied: I have seen a press report of the evidence referred to in the first part of the question. As regards the second part, active steps are being taken to improve the diet of the natives in the High Commission Territories, such as an extensive scheme in Basutoland to promote the cultivation of vegetables, and in Bechuanaland the expenditure of large sums of money to improve the water-supplies, and the teaching of the value of green foodstuffs. I may add that the question of nutrition in these territories is being examined by the Committee of the Economic Advisory Council appointed to advise on nutritional matters in the colonial dependencies generally. The position with regard to tuberculosis, which is closely linked with the problem of nutrition, is being carefully watched.

MEDICAL NEWS

University of Oxford

The degree of D.M. is to be conferred by decree upon Mr. H. W. B. Cairns, Nuffield professor of surgery; Dr. R. R. Macintosh, Nuffield professor of anæsthetics; Dr. J. Chassar Moir, Nuffield professor of gynæcology and obstetrics; and upon Dr. J. A. Gunn, Nuffield professor of experimental therapeutics.

On Feb. 26th the following degrees were conferred:—

D.M.—G. R. P. Aldred Brown and Joyce Wright.
B.M.—D. M. T. Gairdner.

The Royal College of Physicians of London has given £50 to the University towards an armorial window to be placed in the Old Ashmolean building.

University of Cambridge

Prof. W. L. Bragg, F.R.S., has been elected to the Cavendish professorship of experimental physics in succession to the late Lord Rutherford. Prof. Bragg was appointed director of the National Physical Laboratory last year.

King's College Hospital

Dr. J. A. Drake, dean of the medical school, is retiring under the age limit. He will be succeeded by Dr. J. B. Hunter.

University of London

Mr. R. S. Pilcher has been appointed to the university chair of surgery tenable at University College Hospital medical school.

Mr. Pilcher, who is 35, was educated at St. Paul's School and studied medicine at University College Hospital. He obtained his M.B. degree in 1927 and was awarded the university gold medal. He obtained the M.R.C.P. in 1929 and the F.R.C.S. in 1930, and the following year took his M.S. degree. After holding house appointments at University College Hospital he was appointed Harker-Smith registrar and assistant in the surgical unit in 1929. Till 1932 he was responsible for the Harker-Smith reports on radiotherapy. In 1933 he became surgical registrar at the hospital, and the following year first assistant in the surgical unit. In 1936 he was appointed assistant surgeon. His published work includes papers on the diagnosis of malignant disease of the pharynx, carcinoma of the cervical œsophagus and pulmonary embolism.

The title of professor emeritus of pathology in the University was conferred on Dr. A. E. Boycott, F.R.S., formerly Graham professor of pathology at University College Hospital medical school.

Mr. H. L. Eason, principal of the University, Dr. Edward Mapother, medical superintendent and professor of psychiatry at the Maudsley Hospital, and Mr. Clifford White, senior obstetric surgeon to University College Hospital have been elected to the fellowship of University College.

University of Glasgow

Six lectures on the treatment of eye diseases will be given on Tuesdays at 4.30 P.M. from March 8th to April 12th. Prof. A. H. Ballantyne will speak on diseases of the iris, ciliary body and choroid; Dr. John Marshall on diseases of eyelids, conjunctiva and cornea; Dr. I. Chesar Michaelson on squint and other defects of muscle balance; and Dr. J. Burdon-Cooper on the non-surgical treatment of cataract. The lectures will be held in the Tennent Memorial Building, Church-street.

Pharmaceutical Society of Great Britain

A meeting will be held at the house of the Society (17, Bloomsbury-square, London, W.C.) on Tuesday, March 8th, at 8.30 P.M., when Mr. F. W. Gamble, Ph.C., will deliver the Harrison memorial lecture. The title of the lecture will be Facing Realities. The Harrison lectureship medal for 1937 will be presented to Mr. Gamble during the evening.

Oxford Graduates Medical Club

It has been decided to extend the membership of this club to all men who are medical graduates of the University of Oxford, and to abolish the subscription to the club. Those who wish to become members of the club under the new constitution should send their title, name, and address, Oxford college, hospital and date of taking B.A. degree, to the hon. secretaries at 99, Harley-street, London, W.1, so that club notices may be sent to them.

Epsom College

The council of the College will shortly elect one or more St. Anne's scholars. Candidates must be fully nine years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than five years. The value of the scholarships is dependent on the means of the applicant, the locality and fees of the schools selected. Application must be made by May 1st on a form to be obtained from the secretary of the college, 49, Bedford-square, London, W.C.1.

National Hospital for Diseases of the Heart

A course of lectures which are free to all medical men and senior students is being given at this hospital, Westmoreland-street, London, W., on Tuesdays at 5.30 P.M. Dr. John Parkinson gave the first lecture on March 1st, speaking on difficulties in cardiac diagnosis. This week Dr. Evan Bedford is lecturing on auscultation. Announcements of the speakers and their subjects will be found each week in our Medical Diary.

Royal Medical Society of Edinburgh

At the annual dinner held last week Dr. G. J. Cleland, the senior president, said that this society was now in its 201st session. In welcoming Mr. W. J. Stuart, the guest of the evening, he expressed the students' regret at his forthcoming retirement. In reply to the toast Mr. Stuart said that during the 36 years in which he had been on the surgical staff of one or other of the Edinburgh hospitals the saddest development to him was the diminution in the amount of clinical work carried out by the students. Forty years ago the students had freedom to choose the classes they wished to attend and he did not think that nowadays enough work was done by them in the wards. After an eloquent tribute to the surgeons with whom he has worked, he spoke of the important part played by the Royal Medical Society in the training of Edinburgh students. The members learned from the society how to teach, how to conduct a debate, and how to speak at unexpected moments when they had nothing to say. Dr. R. B. Lucas said that during the past year the society has been very active and its premises have been greatly improved. Dr. W. G. Kerr, proposing the toast of The Royal Infirmary, emphasised the importance of the institution from the point of view of the students who greatly appreciated having all the clinical work centralised and next door to the University. Mr. John R. Little, chairman of the board of managers, said he thought the Royal Infirmary suffered greatly from lack of adequate publicity, and appealed to the profession to assist in informing the public of the hospital's work. Referring to the expense incurred in running the new maternity block, he said that personally he felt that the maternity services should be supported by the State or municipality.

British Congress of Obstetrics and Gynæcology

The eleventh British Congress of Obstetrics and Gynæcology will be held in Edinburgh on April 4th, 5th, and 6th, 1939. Those who wish to read papers should write at an early date to the senior local secretary, Dr. E. Chalmers Fahmy, 7, Chester-street, Edinburgh, 3.

St. Mary's Hospital

Applications are invited for a research studentship tenable at the institute of pathology and research of this hospital. Preference will be given to old St. Mary's students. Further information will be found in our advertisement columns.

Rheumatism Congress at Oxford

An International Congress on Rheumatism and Hydrology is to be held at Oxford from March 26th to 31st under the presidency of Sir Farquhar Buzzard. A discussion on wet and dry climates and weather in the causation of disease will be opened by Dr. G. Edström (Sweden), Prof. De Rudder (Germany), and Dr. E. P. Poulton. The clinical, pathological, and therapeutic aspects of juvenile rheumatism will be discussed by Dr. A. G. Gibson, Prof. F. Klinge (Germany), Prof. L. Findlay, Dr. H. Grenet (France), Dr. Wilfrid Sheldon, and Prof. Horvath (Hungary). Further information may be had from the office of the International Society of Medical Hydrology, 109, Kingsway, London, W.C.1.

Westminster Hospital

On March 1st Queen Mary opened the new home and training school for nurses of this hospital on the St. John's-gardens site. In declaring it open she said she wished it to be known as the Queen Mary Nurses' Home. In his address Lord Wigram, the president of the hospital, said that through the home the hospital hoped to make the nurse's lot a happy one. Here she would have the advantage of sleeping away from her work and yet in bad weather have access to the hospital by a covered way. Comfortable single bedrooms, attractive recreation rooms, a games room, a gymnasium, a badminton court, a roof garden, and a sick-bay and surgery had been provided, while in the preliminary training school candidates who wished to join the nursing staff could undergo a two months' preliminary training course during which they would learn sick-room cookery and the elementary principles of nursing. For nurses on the staff there were also lecture rooms, class-rooms, and study libraries.

The home will house 39 nursing sisters, 201 nurses, 12 pupil nurses, and 59 maids, and its entire cost has been met by gifts, including almost £4000 contributed by the nurses themselves. The Earl of Athlone will open the new medical school in May, and in March of next year it is hoped to open the new hospital.

Smoke Abatement in London

With Lord Snell in the chair a conference called by the National Smoke Abatement Society was held at the County Hall, Westminster, on Feb. 25th. Dr. J. S. Owens said that in 1936–37 the deposits of solid matter in London ranged from 172 tons per square mile at Wandsworth Common to 322 tons at Archbishop's Park, with 53 tons of sulphate at Finsbury Park and 7 tons of tar at Golden-lane. Improvement had been at a standstill for fifteen years, and the amount of sulphur had slightly increased. The proportion of domestic to industrial smoke in London was 2·15 to 1. Mr. W. A. Damon, representing the Minister of Health, said he was convinced that, with very few exceptions, industrialists were as anxious as anyone to mitigate the smoke evil and that far better results could be obtained from coöperation than from threats and fines. A combination of local authorities made it possible to employ a well-trained staff of smoke inspectors. Mr. E. H. Keeling, M.P., advocated the formation of an advisory regional smoke abatement committee for London and Greater London. In Whitehall, he said, the open coal fire reigned supreme. Sir David Milne-Watson, governor of the Gas Light and Coke Company, stated that 75,000 tons of soot fell on London every year. He suggested that local authorities should offer a rebate of 3*d.* in the £ to householders producing no smoke. They should also get powers to proclaim a smokeless zone in at least the centre of London.

Institute of Child Psychology

Eight lectures on achieving success in life are being given under the auspices of this institute at Friends House, Euston-road, N.W., on Mondays at 6.15 P.M. The first lectures were given this week and next week's will be found in our Medical Diary. Further information may be had from the secretary of the Children's Centre, The Institute of Child Psychology, 26, Warwick-avenue, London, W.9.

Medical Society of London

The 163rd anniversary dinner was held at Claridge's on March 1st, with the president, Mr. J. E. H. Roberts, in the chair. Mr. R. H. Bernays, M.P., Parliamentary Secretary to the Ministry of Health, in proposing The Society, disarmed criticism by saying, "I know nothing about the subject on which I am going to address you to-night," but having done so was sympathetic with the doctors because, like the politicians, they were judged by results. It had not escaped him either to how large an extent Lettsom had anticipated modern practice in his views on nutrition and his advocacy of soup-kitchens, and how prescient had been John Snow, a later member of the society, who had removed the handle of the Broad-street pump and stopped an epidemic of cholera—a great epidemiological deduction, he remarked. And he concluded with an eloquent plea for the closer working together of voluntary and State services, each realising the difficulties of the other. Mr. Roberts, in reply, spoke of the present prosperity of the society; the number of fellows was greater than ever before, the meetings had been better attended, with the result that the meeting-room was now too small for its purpose; but as the society had now acquired the freehold of its site, and in four years' time certain leases would fall in, there would be an opportunity to increase the amenities if members would complete the endowment fund of £25,000. Whatever was done he hoped there would be no change in the character of the society which had always met "to discuss cases together," the company to include physicians, surgeons, and apothecaries. The toast of the Visitors was proposed by Mr. Alex. E. Roche, with penetrating but kindly humour, and Mr. H. L. Eason, principal of the University of London, replied. At the president's request Mr. Hugh Elliot, a great-grandson of Lettsom, then gave some account of the founder and his times. He had listened to his grandfather telling him about Lettsom's funeral, which was very long and quiet. Lettsom, said his great-grandson, though a Quaker was not a dull fellow, for he had arranged a kind of clinical thermometer in which he showed the various degrees of intoxication. The speeches were over early and there was no rush to depart at their conclusion when much good fellowship ensued.

Vacancies

For further information refer to the advertisement columns

Birmingham, Coleshill Hall.—Deputy Med. Supt., £500.
Birmingham, Queen's Hosp.—Res. Surg. Reg., £125.
Birmingham, St. Chad's Hosp.—H.S., at rate of £150.
Birmingham, Selly Oak Hosp.—Res. Physician, £650.
Birmingham and Midland Hosp. for Women.—H.S., at rate of £100.
Blackburn Royal Infirmary.—Cas. O., £175.
Bradford Children's Hosp.—H.P., £150.
Bradford, Grassington Sanatorium.—Asst. M.O., £175.
Bristol City and County.—Asst. M.O.H. for Air-raid Precautions, £500–£700.
Bristol Eye Hosp.—Jun. H.S., at rate of £100.
British Postgraduate Medical School, Ducane-road, W.—Jun. Asst. to Dept. of Pathology, &c., £300.
Burnley, Victoria Hosp.—H.P., at rate of £150.
Burton-on-Trent General Infirmary.—Sen. H.S., £200.
Canterbury, Kent and Canterbury Hosp.—H.S., £125.
Canterbury, Venereal Diseases Clinic.—Part-time M.O., 3 guineas a session.
Chester City Hosp.—Jun. Res. M.O., £200.
Chester Royal Infirmary.—H.S., and H.S. to Ear, Nose, and Throat and Gyn. Depts., each £150.
Chesterfield and North Derbyshire Royal Hosp.—Cas. O. and Fracture H.S., at rate of £200.
Colchester, Royal Eastern Counties' Institution, &c.—Asst. M.O., £400.
Coventry and Warwickshire Hosp.—Two H.S.'s to Spec. Depts., each £150.
Dagenham Urban District Council.—Deputy M.O.H., £600.
Derby, Bretby Hall Orthopædic Hosp.—Jun. Res. Asst. M.O., £350.
Derbyshire County Council.—Asst. County M.O.H., £700.
Derbyshire Royal Infirmary.—H.S. to Ear, Throat, and Nose Dept., £150.
Doncaster Royal Infirmary.—Fracture H.S., £200.
Dudley, Guest Hosp.—Two H.S.'s, £100–£130.
Ealing Borough.—Asst. M.O., £450.
Eastbourne Royal Eye Hosp.—H.S., £100.
Essex County Council.—Part-time Ophth. Surgeon, at rate of £200.
Evelina Hosp. for Sick Children, Southwark, S.E.—Fourth Physician, 50 guineas.
Gloucestershire County Council.—Two Asst. County M.O.H.'s, each £500.
Gt. Barrow, Barrowmore Tuberculosis Sanatorium and Settlement. H.P., at rate of £150.
Guildford, Royal Surrey County Hosp.—H.S., and H.P. and Cas. O., each at rate of £150.
Hampstead General and North-West London Hosp., Haverstock Hill, N.W.—Res. Cas. M.O., at rate of £100.
Harefield, County Sanatorium.—Physician, £1000.
Hertford County Hosp.—H.P., at rate of £150.
Hertfordshire General Hosp.—H.S., £100.
Hôpital et Dispensaire Français, 172, Shaftesbury-avenue, W.C.—Anæsthetist, £25.
Hosp. for Consumption, &c., Brompton, S.W.—Physician.
Hosp. of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Asst. Phys.
Ilford, King George Hosp.—Res. Anæsthetist and H.P., at rate of £150.
Indian Medical Service.—Commissions.
Ipswich, East Suffolk and Ipswich Hosp.—H.P. and H.S. to Spec. Dept., &c., each £144.
Isleworth, West Middlesex County Hosp.—Anæsthetist and Asst. M.O., each £400.
Leamington Spa, Warneford General Hosp.—Res. H.P., at rate of £150.
Leeds Public Dispensary and Hosp.—H.P., at rate of £150.
Lincoln, Bracebridge Heath Hosp.—Second Asst. M.O., £475.
Liphook, King George's Sanatorium for Sailors.—Asst. M.O., at rate of £200.
Liverpool, County Mental Hosp., Rainhill.—Asst. M.O. Locum Tenens, 7 guineas per week.
London County Council.—Asst. M.O.'s, Grade I and II, £350 and £250 respectively.
London Jewish Hosp., Stepney Green, E.—Ear and Throat Registrar, 20 guineas.
Maidstone, West Kent General Hosp.—H.S., £175.
Manchester, Ancoats Hosp.—Cas. O., £175. Also H.S., at rate of £100.
Manchester, Park Hosp., Davyhulme.—Second Res. M.O., at rate of £300.
Manchester Royal Eye Hosp.—Jun. H.S., £120.
Manchester, St. Mary's Hosps.—H.S.'s to Spec. Depts., each at rate of £50.
Manchester and Salford Hosp. for Skin Diseases.—H.S., at rate of £150.
Middlesex County Council.—Sen. Obstet. Surgeon for Redhill County Hosp., £850. Tuberculosis M.O., £750. Also Obstet. Surgeon for North Middlesex County Hosp., £500.
Mount Vernon Hosp., Northwood.—H.S., £150.
National Temperance Hosp., Hampstead-road, N.W.—Res. M.O. and Cas. O., at rate of £175 and £120 respectively.
Nelson Hosp., Merton, S.W.—Res. H.S., at rate of £150.
Newark General Hosp.—Res. H.S., at rate of £175.
North Middlesex County Hosp., Edmonton.—Jun. Res. Asst. M.O., at rate of £250.
Norwich City.—Asst. M.O.H. and Asst. School M.O., £600.
Norwich, Jenny Lind Hosp. for Children.—Res. M.O., £120.
Oxford, Wingfield-Morris Orthopædic Hosp., Headington.—H.S., at rate of £100.
Pembroke County War Memorial Hosp.—Res. H.S., £200.
Plymouth, Prince of Wales's Hosp., Greenbank-road.—Asst. Pathologist, £500. Also H.S., at rate of £120.
Princess Beatrice Hosp., Earl's Court, S.W.—Cas. O. and Obstet. H.S., at rate of £120.
Princess Elizabeth of York Hosp. for Children, Shadwell, E.—H.P., at rate of £125.
Princess Louise Kensington Hosp. for Children, St. Quintin-avenue, W.—H.S., at rate of £120.
Queen Mary's Hosp. for the East End, E.—Clin. Asst. to Skin Dept.
Queen's Hosp. for Children, Hackney-road, E.—Asst. Physician.
Rochdale Infirmary and Dispensary.—H.P., £150.
Royal Army Medical Corps.—Commissions.
Royal Cancer Hosp., Fulham-road, S.W.—Second Asst. Pathologist, £250. Also H.S., at rate of £100.
Royal College of Surgeons of England.—Annual Examinerships. Also Examiner in Dental Surgery.
Royal Eye Hosp., St. George's-circus, S.E.—Research Assts.
Royal London Ophthalmic Hosp., City-road, E.C.—Two Out-patients' Officers, each £100.
Royal National Orthopædic Hosp., 234, Gt. Portland-street, W.—Two H.S.'s, each at rate of £150.
Royal Northern Hosp., Holloway, N.—H.S., at rate of £70.
Ryde, Royal Isle of Wight County Hosp.—Jun. H.S., £120.
St. John's Hosp., Lewisham, S.E.—Hon. Physician to Children's Dept.
St. Mary's Hosp., Institute of Pathology and Research, W.—Research Studentship, at rate of £200.
St. Peter's Hosp. for Stone, &c., Henrietta-street, W.C.—H.S., at rate of £75.
Salford Royal Hosp.—H.P., three H.S.'s, and Cas. H.S., each at rate of £125.
Seaton Valley Urban District Council, &c.—M.O.H., &c., £1100.
Sheffield Children's Hosp.—H.S., at rate of £100.
Sheffield, Winter-street Hosp.—Asst. Tuber. O., £350.
Shoreham-by-Sea, near Brighton, Southlands Hosp.—Res. Asst. M.O., £300.

South London Hosp. for Women, Clapham Common, S.W.—H.P., at rate of £100. Also Clin Assts.
Southampton, Free Eye Hosp.—H.S., £150.
Staffordshire General Infirmary.—Hon. Visiting Surgeon.
Stockport, Stepping Hill Hosp.—Res. Asst. M.O., £350.
Stoke-on-Trent, Stanfield Sanatorium.—Res. M.O., £350.
Sudan Medical Service.—Medical Inspector, £E720.
Surrey County Council.—Asst. M.O., £600.
Taunton and Somerset Hosp.—H.S., £125.
Walsall Manor Hosp.—Res. Asst. M.O., £350. Jun. Asst. M.O., £150. Also Con. Obstetrician and Gynæcologist, 3 guineas per session.
Warrington Infirmary and Dispensary.—Third Resident, at rate of £150.
West Bromwich, Hallam Hosp.—H.S., at rate of £200.
West London Hosp., Hammersmith, W.—H.P. and H.S., each at rate of £100.
West Riding of Yorkshire County Council.—Asst. County M.O., £960.
Western Ophthalmic Hosp., Marylebone-road, N.W.—Sen. H.S. and Jun. H.S., £150 and £100 respectively.
Willesden General Hosp., Harlesden-road, N.W.—Res. Officer, at rate of £100.
Worksop Victoria Hosp.—Jun. Res., £125.
Wrexham and East Denbighshire War Memorial Hosp.—Two Res. H.S.'s, each at rate of £150.
York County Hosp.—H.S., £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Tintern (Monmouth).

Medical Referee under the Workmen's Compensation Act, 1925, for the Selkirk Sheriff Court District (Sheriffdom of Roxburgh, Berwick, and Selkirk). Applications should be addressed to the Private Secretary, Scottish Office, Whitehall, London, S.W.1, before March 18th.

Medical Referee under the Workmen's Compensation Act, 1925, for the Dartford; and Gravesend (Circuit No. 56) and Grays Thurrock; and Southend (Circuit No. 58) County Court Districts. Applications should be addressed to the Private Secretary, Home Office, Whitehall, London, S.W.1, before March 24th.

Medical Diary

March 7th to March 12th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY.

Therapeutics and Pharmacology. 5 P.M., Dr. W. W. Payne: Vegetable Proteins in the Treatment of Diabetes. Dr. R. D. Lawrence and Dr. R. S. Aitken: Zinc Protamine Insulin.

Psychiatry. 5.30 P.M., clinical meeting at the Maudsley Hospital, Denmark-hill, S.E.

WEDNESDAY.

Surgery: Subsection of Proctology. 8.30 P.M., Mr. T. F. Todd: Rectal Ulceration following Irradiation Treatment. Mr. Cecil Joll: Excision of the Colon for Carcinoma. Mr. Ac Hedley Whyte: Post-anal, so-called Pilonidal, Sinus. Mr. W. B. Gabriel: An Adaptable Light for Proctoscopy. Mr. A. Lawrence Abel: Abdomino-perineal Excision and Partial Colectomy (Films).

FRIDAY.

Ophthalmology. 8.30 P.M. (Cases at 8 P.M.), Mr. Eugene Wolff: Hexagonal (Polygonal) Figures formed by the Outer Portions of the Rods and Cones. Can the Network formed by the Pigment of the Retinal Pigment Epithelium be seen with the Ophthalmoscope? Mr. E. B. Alabaster: The Use of Wire Splints in Operations for Convergent Strabismus.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY.—9 P.M., Dr. George Graham: A Survey of the Changes and Results of Treatment of Diabetes in the Last 15 Years. (Last Lettsomian lecture.)

HARVEIAN SOCIETY OF LONDON.
THURSDAY.—8.30 P.M. (26, Portland-place, W.), Sir Arthur Hurst: Physical Basis of "Biliousness," "Wind Round the Heart," and some other Popular Maladies. (Harveian lecture.)

LONDON JEWISH HOSPITAL MEDICAL SOCIETY, Stepney Green, E.
THURSDAY.—3.15 P.M., Dr. H. B. Morgan, Dr. D. C. Norris, and Mr. J. L. Smyth: Industrial Disease.

SOUTH-WEST LONDON MEDICAL SOCIETY.
WEDNESDAY.—9 P.M. (Bolingbroke Hospital, Wandsworth Common, S.W.), Dr. F. M. Allchin: The Present Position of Radiotherapy.

PADDINGTON MEDICAL SOCIETY.
TUESDAY.—9 P.M. (Tuberculosis Dispensary, 20, Talbot-road, W.), Mr. A. Simpson-Smith: Pre- and Post-operative Treatment of Surgical Cases.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.
FRIDAY.—8.45 P.M. (Miller General Hospital, Greenwich, S.E.), Mr. H. E. Griffiths: Incapacity for Work following Fractures.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.
THURSDAY.—8.15 P.M. (11, Chandos-street, W.), Prof. John Macmurray: A Philosopher's View of Modern Psychology.

BIOCHEMICAL SOCIETY.
FRIDAY.—2.30 P.M. (University College, Gower-street, W.C.), annual general meeting. Short communications and demonstration.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY and THURSDAY.—5 P.M., Dr. C. C. Ungley: Some Deficiencies of Nutrition and their Relation to Disease. (Goulstonian lectures.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY.—5 P.M., Dr. L. W. Proger: Demonstration of New Museum Specimens.
FRIDAY.—5 P.M., Dr. A. J. E. Cave: Anatomy of the Diaphragm.

UNIVERSITY OF GLASGOW.
TUESDAY.—4.30 P.M. (Tennent Memorial Building, Church street), Prof. A. J. Ballantyne: Diseases of the Iris, Ciliary Body, and Choroid.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE 28, Portland-place, W.
WEDNESDAY.—3.30 P.M., Dr. Clifford Hoyle: The Prevention of Minor Ailments.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.
TUESDAY.—5 P.M., Prof. J. H. Gaddum, Sc.D.: Ephedrine. (Sydney Ringer lecture.)

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Dr. J. G. Scadding: Respiratory Function in Disease (2). 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Dr. Dorothy Russell: Tumours of the Central Nervous System and Meninges.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 2.30 P.M., Mr. L. R. Broster: Surgical Application of Endocrinology with Special Reference to the Adrenal Glands. 3.30 P.M., Mr. Malcolm Donaldson: Dysmenorrhœa. 4.30 P.M., Mr. Kenneth Walker: Venereal Diseases.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. Geoffrey Keynes: Diseases of the Breast.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY.—3.30 P.M., Dr. C. P. Symonds: Cerebral Tumours (2).
TUESDAY.—3.30 P.M., Dr. F. M. R. Walshe: Diseases of Extrapyramidal Motor System.
WEDNESDAY.—3.30 P.M., Dr. Walshe: clinical demonstration.
THURSDAY.—3.30 P.M., Mr. Geoffrey Jefferson: Head Injuries.
FRIDAY.—3.30 P.M., Dr. E. A. Carmichael: Syringomyelia.
Out-patient clinic daily at 2 P.M.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Dr. E. A. Cockayne: Meningitis in Infancy. 3 P.M., Mr. J. H. Doggart: Causes of Nystagmus in Infants and Young Children.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY.—5.30 P.M., Dr. D. Evan Bedford: Auscultation.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY.—4 P.M., Mr. H. Lawson Whale: Influenza and the Upper Air-passages.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY.—4 P.M., Mr. N. Asherson: Affections of the Lingual Tonsil.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SATURDAY.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E., all-day course in medicine, surgery, and gynæcology.—F.R.C.S. (PRIMARY) COURSE IN PHYSIOLOGY, Mon., Wed., and Fri., at 5.30 P.M.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W., Tues. and Thurs., at 8 P.M., M.R.C.P. clinical and pathological course.—ST. MARK'S HOSPITAL, City-road, E.C., all-day course in proctology.—BROMPTON HOSPITAL, S.W., 5 P.M. twice weekly, M.R.C.P. course in chest diseases.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, S.W.
WEDNESDAY.—4 P.M., Mr. E. G. Muir: Some Minor Disorders of the Rectum.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY.—4.30 P.M., Mr. A. G. Timbrell Fisher: Physical Medicine and Orthopædic Surgery (1).

INSTITUTE OF CHILD PSYCHOLOGY.
MONDAY.—6.15 P.M. (Friends House, Euston-road, N.W.), Dr. Ethel Dukes: The Successful Wife. 8.15 P.M., Dr. M. Bevan-Brown: Adequate Parenthood.

MANCHESTER ROYAL INFIRMARY.
FRIDAY.—4.15 P.M., Mr. A. H. Southam: clinical demonstration.

ANCOATS HOSPITAL, Manchester.
THURSDAY.—4.15 P.M., Mr. E. E. Hughes: Renal Hæmorrhage.

LEEDS GENERAL INFIRMARY.
TUESDAY.—3.30 P.M., Dr. F. F. Hellier: The Value of X Ray Treatment in Dermatology.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY.—4.15 P.M. (Victoria Infirmary), Dr. W. Herbert Brown: Skin Diseases.

NOTES, COMMENTS, AND ABSTRACTS

AIR-RAID PRECAUTIONS IN A MENTAL HOSPITAL

By Allen C. Hancock, M.C., M.B. Lond., D.P.H., D.P.M.

MEDICAL SUPERINTENDENT OF THE KENT COUNTY MENTAL HOSPITAL, MAIDSTONE; AND

T. R. Forsythe, M.B. Sheff., D.P.M.

DEPUTY MEDICAL SUPERINTENDENT OF THE HOSPITAL

The mental hospital at Barming Heath, Maidstone, occupies a prominent position half-way between London and the Coast; two railways lie in the vicinity; it is bounded on three sides by important roads and is within a few miles of a famous dockyard. There are approximately 2500 residents.

Early in 1935 it occurred to us that we ought to decide what steps could be taken to protect the personnel in the event of an air-raid on the district. Protective measures seemed increasingly necessary as we watched the progress of general rearmament and the gathering war-clouds in various parts of the world, and we were particularly impressed by the accounts of advanced methods of aerial warfare. We learned, for instance, that five aeroplanes employing the "high spray" method could intensely contaminate the whole area of the Maidstone Mental Hospital with liquid mustard in almost as many seconds. We therefore made a survey of personnel and material at our disposal and discussed our position with the commanding officer of the local depôt, who held an inaugural demonstration in the use of the respirator and later lent us about fifty of these so that we could commence to train our squads.

FIG. 1

Our next step was to consider the lay-out of the hospital from its highest point and from a large-scale map, and we decided to divide it into several strategic areas with a site for a sub-headquarters for each and a central headquarters to control all. We allotted to each sub-headquarters a sick ward that could be used for the treatment of casualties, and one for decontamination. It was found comparatively simple to draw up plans for the conversion of some of the existing bathing establishments for the latter purpose. It was arranged that the sub-headquarters should be in charge of a competent official who would have under his authority a number of squads for various purposes, together with some reserves. The squads would be provided with all the essential equipment for their special duties. Handcarts or other available vehicles would be necessary for the transport of heavy tools and other materials to the place where their presence would be required. Telephonic communication with central headquarters and with the other sub-headquarters would be essential, whilst runners with bicycles would be necessary against the event of a breakdown of the telephone service. The fire station would be manned

FIG. 2

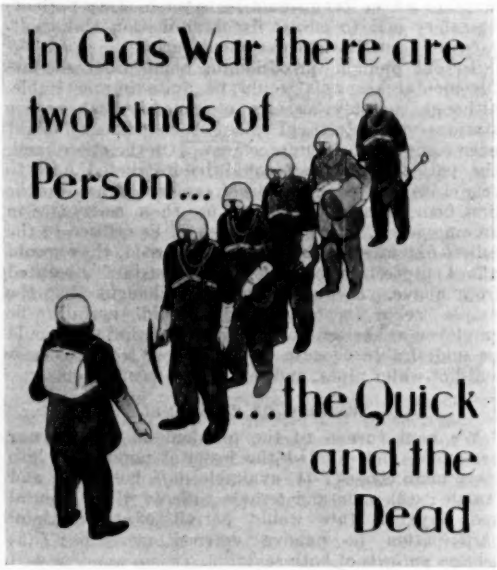
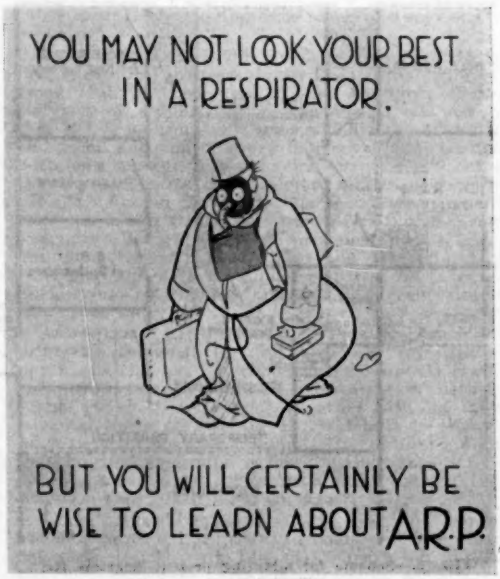


FIG. 3



by the appropriate squad, whose numbers would be augmented in case of casualties, whilst the engineer's department would be the obvious habitat of the demolition squad. Posts were then selected for wardens whose duty would be to guide stray patients to safety and to ensure decontamination and treatment of casualties if these should arise.

In our opinion, provision of bomb-proof shelters for mental hospitals would be quite impracticable, although possibly, certain of the essential service stations—the electrical plant for instance—might need some form of reinforcement. On the other hand, the patients and staff could be instructed how to render certain rooms gas-proof, preferably those on the first floor, so that they could use them as refuges in an emergency. Covered ways could be utilised to the fullest extent since, being tiled or glazed, they would afford protection against liquid mustard liberated from above. It was at one time thought that the ample cellar accommodation could usefully be employed as shelter, but we concluded that this would be undesirable because of the danger from furnaces and hot-water pipes, and inadequate ventilation.

TRAINING OF PERSONNEL

We next turned to the problem of training our personnel, and divided the hospital population into three main classes: (1) available *staff*, both male and female; (2) male and female *patients* whose mental and physical state would permit of their useful participation in passive defence measures; (3) *helpless patients* of both sexes.

(1) In the event of war the male staff would rapidly diminish—particularly the younger ones who would be called to the colours—so they could not be counted as assets in the present scheme, although they would be invaluable for training purposes, especially as many of them are reservists, and not a few have actually been on active service. The older men would, however, have a more certain rôle to fill. The female nurses would have their time fully occupied by indoor activities, including dressing casualties, shepherding patients to places of safety, and supervising their well-being.

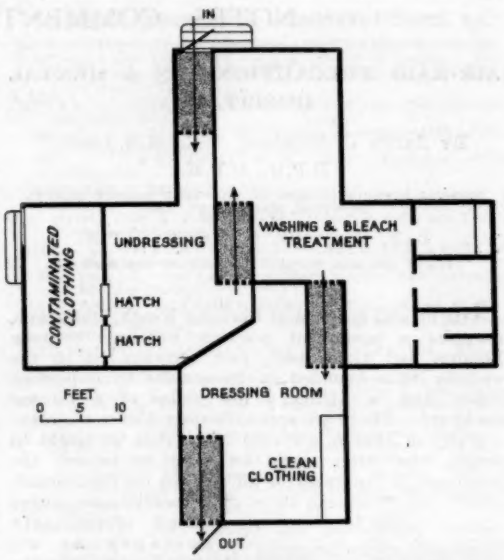


FIG. 4.—Scheme for adapting female occupation room as a decontamination centre.

(2) In normal times a great deal of the hospital's routine work is carried out by patients who, owing either to long residence or to the nature of their illness, require few restrictions on their movements and little observation. Experience has shown that such persons take a very intelligent interest in the march of events, and if called upon would probably prove to be a very valuable asset in passive defence. At a recent air-raid precaution demonstration held here a large number of male patients took an active part and behaved most efficiently and calmly though they had then received little training. They performed the duties of wardens very satisfactorily. Their value is therefore obvious, and, under the leadership of a member of the staff, they could reasonably be counted as effective participants in the general scheme. Suitable patients—preferably the usual ward-workers—could also be trained in the work of rendering wards gas-proof and in assisting the nurses.

(3) Precautionary methods in connexion with the helpless patients would merely involve their rapid transfer to a place of comparative safety, together with the cleansing of any who may have become contaminated whilst proceeding to the place of shelter. In this connexion we think that some form of training for every available person is undoubtedly desirable, even though it merely consists in teaching the value of discipline, but wherever possible patients should be taught to wear respirators and to appreciate their protective value. The degree of success in this part of the scheme would depend to a great extent on the demeanour and resolution of the nurses. Contrary to popular belief, however, panic is perhaps less probable among the mentally sick than among members of the general civilian population.

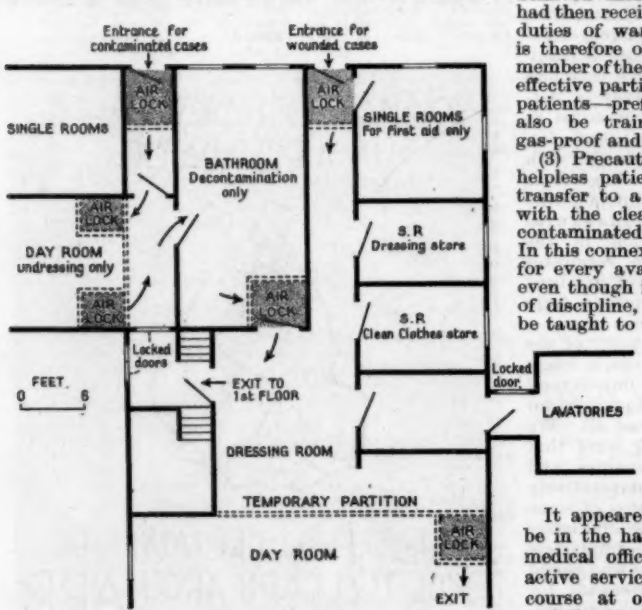


FIG. 5.—Scheme for adapting present quarters for emergency use.

It appeared essential that the organisation should be in the hands of some senior official, preferably a medical officer. Besides having had experience on active service, he should have recently attended a course at one of the recognised anti-gas schools and should possess an instructor's certificate.

As we considered that coöperation with the local

authority was desirable, liaison was established with the county A.R.P. officer who has given us the benefit of his experience and special knowledge continuously since our scheme came into being. It had to be borne in mind, however, that a mental hospital is largely a self-governing and self-organised unit which is always best served by those who understand the patients and are thoroughly familiar with the working of the place.

Posters of a striking nature were exhibited in the hospital and helped to stimulate the growing interest in the scheme (Figs. 1–3).

Lectures to a class consisting of all heads of departments and senior officials paved the way to encouraging interest among the lower ranks of the establishment. These lectures were given at regular intervals and were as follows :—

LECTURE I—*Nature of Chemical Warfare*
Statistics from the Great War.
Historical survey from 404 B.C. to modern times.
Types of chemicals used.
Salt and coal derivatives.
Elementary chemistry and physics of the war chemicals.
Their general properties and effects.

II—*Mustard Gas in Detail*
Individual protection—the chemical respirator.
Weapons by which gas may be used—e.g., the projectile, bomb, and spray.

III—*Organisation of a General Defence Scheme*
Decontamination, demolition, and fire.

IV—*Collective Protection*
The passive and active population.
The decontamination squad.
Their duties in detail.

V—*Decontamination—its Significance*
Types of contamination.
Effects of the elements.
General principles of decontamination.
Details of methods employed in decontaminating various surfaces and materials.

VI—*Bodily Injuries from Chemical Poisons and Appropriate First-aid Measures*
(*a*) Lacrymatory gases ; (*b*) asphyxiating and choking gases ; (*c*) vesicants ; (*d*) accidental gases.
Casualty organisation.

The demonstration models were made by selected patients in the occupational therapy rooms. The plans of these were drawn up previously by the hospital A.R.P. officer (T. R. F.).

Respirator drill was included in the general instructional course. Respirators were not available in any quantity at that time and the local garrison helped us to solve the difficulty. Later, when the scheme had been approved by the A.R.P. department of the Home Office, an issue not only of respirators but also of protective clothing for the Institution resulted.

When initial interest had been created, the next step was to disseminate the doctrine of "gas-mindedness" among the remainder of the population. We found it advantageous to emphasise to each individual that in the event of an air-raid he or she would have a most important duty to carry out, and that in no circumstances would their personal efforts be regarded as trivial.

Practical work is now following hard upon the heels of theory, for efficiency without confusion will be the true test. Squads are already formed and trained in first aid, decontamination, demolition, and fires, particularly those arising from incendiary bombs. Further developments will follow in the course of time with the gradual absorption of more and more patients into the scheme.

A point of practical importance is the method of giving the gas alarm. This should be distinctive from the fire alarm and also should not be easily confused with motor horns. We have found that striking shell-cases or suspended steel bars is distinctive and efficient. Alarms were placed at frequent intervals in the hospital and grounds and were operated by gas sentries, who were male patients suitably clothed and trained.

We are fortunate in that almost all parts of the hospital may be reached under cover. The sites chosen for the treatment of casualties are ordinary sick wards which would require little alteration to fulfil their emergency function, whilst Figs. 4 and 5 suggest a means of improvising first-aid decontamination centres from existing buildings. We have a large-scale map showing roads and alternative routes and positions of the fire hydrants, since they must be known to the decontamination squads as well as to the fire parties.

The magnitude of the problem is now coming to be appreciated by all members of the staff and by many patients. The squads have been tested in action and under control of central headquarters at which Home Office experts were present in an advisory capacity.

A small building, specially designed, is in course of construction and will ultimately be used as a gas store.

In addition to the general progress of instruction, experiments are to be carried out to ascertain the effect of the respirator upon patients suffering from various cardiac, pulmonary, and other diseases. Further, in the immediate future the number of active squads will be increased and the general field of operations widened.

We hope that this account of our organisation may be of some assistance to the administrators of other institutions who are embarking on protective schemes.

NEW PREPARATIONS

"FERRÆMIA" BRAND TABLETS, made by Wilcox, Jozeau and Co. Ltd. (North Circular-road, London, N.W.2), are intended for use wherever treatment with iron is needed. Each tablet is stated to contain ferrous sulph. exsicc. 2¾ grains, dried yeast gr. 2, copper sulphate gr. 1/100, and manganese hypophosph. gr. 1/32, with an excipient and a chocolate coating. Soluble ferrous salts of iron are readily assimilated, and the small doses required "do not constipate, cause gastric upset or produce any other undesirable sequelæ."

SEVENSEAS COD LIVER OIL is prepared by British Cod Liver Oil Producers (Hull) Ltd., of St. Andrew's Dock, Hull, in "the world's largest and most efficient cod-liver oil refinery." The advantages claimed are that it has no trace of the usual objectionable taste and smell and that "every delivery is standardised both as regards general character and vitamin potency." Besides their Standard oil, which complies with the British Pharmacopœia standard as regards vitamins A and D, the company sell SevenSeaS High Potency Oil (in bottles or capsules) which has a minimum strength four times the B.P. standard. It is guaranteed to be a pure cod-liver oil to which nothing has been added, and "the protective dose is five drops only."

AMPOULES "RETICULOGEN."—This preparation is primarily designed for intramuscular injection in pernicious anæmia. Each 0·5 c.cm. ampoule is said to contain the hæmopoietic equivalent of between 3 and 4·5 kg. of fresh liver, together with 500 international units of vitamin B_1, which it is thought may prevent nervous lesions. The ordinary maintenance dose suggested is one ampoule once a week or once a fortnight. The distributors are Eli Lilly and Company, Ltd., 2, Dean-street, W.1.

CAAPI ANTI-CORYZA TABLETS contain several remedies regarded as useful in colds and respiratory catarrhs. H. R. Napp Ltd. (3, Clements-inn, W.C.2), the manufacturers, give the formula as atropine

sulphate 1/180 grain, caffeine gr. 1, phenacetin gr. 2, quinine alkaloid gr. ¼, and cinnamon pulvis gr. 1.

"DESITIN" BRAND OINTMENT is a cod-liver oil preparation which is said to keep indefinitely. A thin layer spread over the skin does not liquefy with the heat of the body and forms a bland covering that favours healing and epithelialisation of burns, ulcers, and wounds with large surfaces. The ointment is also recommended for the treatment of a variety of skin diseases, including eczema, herpes, and seborrhœa. It is composed of cod-liver oil 15 parts, zinc oxide 38, talc 4, lanolin 10, and a soft paraffin 33. It is sold by Desitin Products Ltd., N.W.10.

FROM C. R. HARKER, STAGG AND MORGAN LTD. (Emmott-street, E.1) we have received an elaborate brochure describing the use of Unguentolan, a cod-liver oil ointment made by Heyl and Co., of Berlin, at the direction of Prof. W. Löhr of Magdeburg, who introduced the local use of cod-liver oil for burns six years ago (see *Lancet*, 1934, **2**, 367). Besides 67 photographs this brochure contains full summaries of 32 papers on the subject, and should be valuable to anyone requiring information about the method.

A new booklet on Streptocide (sulphanilamide Evans) reaches us from EVANS SONS LESCHER AND WEBB (Liverpool and London) who now issue this remedy in folded powders as well as tablets. They also send an account of diphtheria immunisation with Alum Precipitated Toxoid and Toxoid Antitoxin Floccules. The A.P.T. is now more concentrated than formerly and two doses are definitely advised.

In a new booklet produced by the MARMITE FOOD EXTRACT CO. LTD. (Walsingham House, Seething-lane, E.C.3), attention is directed to the advantages of this autolysed extract of fresh brewers' yeast as a rich source of the vitamin-B complex, as an anti-anæmic agent, and as a prophylactic and therapeutic agent in tropical medicine. New evidence of the nutritional value of Marmite in pregnancy is quoted from the accounts by Dr. Margaret Balfour, Dr. G. C. M. M'Gonigle, and others of the spectacular fall in the mortality-rate which has followed the supplementary feeding of expectant mothers in certain of the depressed areas.

JOINT TUBERCULOSIS COUNCIL

THE meeting of this council on Feb. 19th marked the end of the long secretaryship of 14 years of Dr. Ernest Ward, the originator of the council.

The officers for 1938 are: chairman, Dr. S. Vere Pearson (Mundesley); vice-chairmen, Dr. G. Lissant Cox (Lancashire) and Dr. D. A. Powell (Cardiff); secretary, Dr. J. B. McDougall (Preston Hall, Kent); treasurer, Dr. G. Jessel (Lancashire); auditor, Dr. D. P. Sutherland (Manchester). The council decided to publish the exhaustive report on sputum examination prepared by its committee. The Ministry of Health had replied to a communication to the effect that in classifying patients who showed tubercle bacilli in discharges from glands, bones, and joints, "T.B. plus" or "T.B. minus" related only to those suffering from pulmonary tuberculosis, and not to those with tubercle bacilli in other discharges. The view was expressed that as many medical associations as possible interested in tuberculosis should have official representation on the council. Dr. Ward, in his biennial report, paid special attention to the microscopical examination of sputum, culture of tubercle bacilli, examination of contacts, results of artificial pneumothorax treatment, tuberculosis amongst nurses, milk, tuberculin, and sedimentation. The treasurer's report emphasised the need for additional sales of the council's publications. The statement for the year 1937 showed a credit balance of £53 16*s.* 9*d.* The expansion of the work of the council, however, had necessitated greater demands on its financial resources, and a finance and publicity committee has been set up. A memorandum was presented for submission to the interdepartmental committee on nursing services. It gave a comprehensive account of the problems in relation to tuberculosis institutions in this country, including the inauguration of a supplementary register, hours of duty, definition of "assistant nurses," factors influencing recruitment, employment of tuberculous ex-patients as nurses, and suggestions for improved remuneration and conditions of service. The radiological interpretation committee had been successful in coöpting representatives of the radiological societies in this country, and a comprehensive report will be available in due course.

The next meeting of the council is to be held on May 21st.

Appointments

GARLAND, H. G., M.D. Leeds., M.R.C.P., Hon. Neurologist to the Leeds Jewish Herzl Moser Hospital.

HOYLE, CLIFFORD, M.D., M.R.C.P. Lond., Assistant Physician to King's College Hospital, London.

KIERNANDER, F. B., M.B., M.R.C.P.Lond., Assistant Radio-therapist at University College Hospital, London.

LISHMAN, F. J. G., M.D. Lond., D.P.H., D.L.O., Deputy Medical Officer of Health for Gloucestershire.

MACKENZIE, N.F., M.B. Edin., D.P.M., Deputy Superintendent at the Brockhall Certified Institution for Mental Defectives, Langho, near Blackburn.

MORGAN, J. G., M.B. Lond., D.P.H., Medical Officer of Health for Pontardawe rural district.

*SKLARZ, ERNST, M.D. Breslau, L.R.C.P. Edin., Lecturer in Dermatological Pathology at the Hospital for Diseases of the Skin, Blackfriars.

TAYLOR, R. G., M.B. Dubl., F.R.C.S. Eng., Clinical Assistant in the Orthopædic Department of the Royal Infirmary Sheffield.

TENNENT, THOMAS, M.D. Glasg., M.R.C.P. Lond., D.P.H., D.P.M., Medical Superintendent at St. Andrew's Hospital, Northampton.

THOROLD, G. P., B.M. Oxon., Medical Registrar at the St. John Clinic and Institute of Physical Medicine, London.

UNGER, W. F. M., M.D. Berlin, L.R.C.P. Edin., Assistant Medical Officer in the Out-patient Department of the Royal Manchester Children's Hospital.

YORKE, H. E., L.M.S.S.A., Chief Assistant in the X Ray Department of St. Bartholomew's Hospital.

Certifying Surgeons under the Factory and Workshop Acts: DR. C. F. LEONARD (Brixworth District, Northampton); Dr. A. BOYLE (New Mills District, Derby); Dr. E. B. BARTON (Silloth District, Cumberland); Dr. W. H. DUNN (Solihull District, Warwick); Dr. T. DUNLOP (Tilbury District, Essex); Dr. H. FOWLIE (Appleby District, Westmorland); Dr. G. ABBEY (Tutbury District, Stafford); Dr. D. A. SMITH (Newcastle District, Northumberland); Dr. A. S. KITCHEN (Colmonell District, Ayr); Dr. D. MACKIE, M.C. (Glenorchy and Inishail District, Argyll); Dr. W. D. MCLELLAN (Strachur District, Argyll); Dr. W. B. RUSSELL (Ballantrae District, Ayr); Dr. A. CAMERON (Saddell-and-Skipness District, Argyll); Dr. D. MACQUEEN (Killean and Kilkenzie District, Argyll); Dr. J. MACINTYRE (Lochgoilhead and Kilmorich District, Argyll); Dr. R. A. M. DAVIDSON (Dunscore and Glencairn District, Dumfries).

* Dr. Sklarz's name and qualifications were incorrectly given in our issue of Feb. 5th.

Births, Marriages, and Deaths

BIRTHS

ADDISON.—On Feb. 22nd, at Nuffield House, S.E., the wife of Dr. George Addison—a daughter.

EVANS.—On Feb. 26th, 1938, at Chelford, Cheshire, the wife of Dr. Ernest Sandford Evans—a son.

MARRIAGES

NICHOLSON—BURDON-COOPER.—On Feb. 19th, at St. Columba's, Pont-street, Bernard Clive Nicholson, M.D., M.R.C.P., to Frances Rose, younger daughter of Dr. Burdon-Cooper, of Bath.

DEATHS

DAKIN.—On Feb. 26th, at Colsterworth, Thomas Burns Dakin, M.R.C.S. Eng, aged 67.

DREW.—On Feb. 27th, at Weston-super-Mare, John Harmer Drew, M.D. Lond., aged 56 years.

GANN.—On Feb. 24th, in London, Thomas Gann, M.R.C.S. Eng., D.T.M. Liverp., late P.M.O., British Honduras.

FITZMAURICE.—On Feb. 25th, in India, James Francis Fitzmaurice, L.R.C.P.I., late chief medical officer, Kolar Gold Field.

GILBERTSON.—On Feb. 22nd, at Hitchin, James Henry Gilbertson, M.R.C.S. Eng, aged 77.

MEADE-KING.—On Feb. 25th, at Taunton, Richard Liddon Meade-King, M.D. Durh., aged 68.

MITCHELL.—On Feb. 22nd, at Templemore, Co. Tipperary, Gerald Mitchell, M.D., M.Ch. R.U.I.

ROUGHTON.—On Feb. 27th, suddenly during Mediterranean cruise, John Paul Roughton, J.P., M.R.C.S. Eng., of Cambridge, formerly of Kettering, and late Assistant Electrician, St. Bartholomew's Hospital.

SLATTER.—On Feb. 21st, Oliver Thomas Slatter, M.R.C.S. Eng., late of Rothley, Leicester, in his 85th year.

WALKER.—On Feb. 27th, John Frederick Walker, M.B. Lond., J.P., of Southend-on-Sea.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.